kasneb

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

FRIDAY: 27 November 2020.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a)   Securitisation may be the wave for the future as it appears to be a more efficient mechanism for bringing borrowers and investors together than traditional financing through intermediaries. This was the closing remark by a presenter in a securitisation seminar.

Required:
In relation to the above statement:

(i)   Explain the term "securitisation".   (2 marks)

(ii)   Discuss three benefits that may accrue to a company that uses securitisation in its operations.   (3 marks)

(b)   Nancy Chepkonga recently retired from employment and received a lumpsum pension benefit. The company had earlier arranged for a retirement planning seminar where one of the presenter noted that one can generate superior returns in their portfolio by incorporating alternative investments. Nancy is naive about these new products and has approached you for professional advice.

Required:
In light of the above statement, advise Nancy on two pros and two cons of alternative investments for retirees.
                                                                                                (4 marks)

(c)   Evaluate three outside service providers involved during creation and operationalisation of alternative investments in your country.   (6 marks)

(d)   An investment analyst working with Lion Capital has gathered the following data relating to four collateralised mortgage obligation (CMO) tranche:

Security	Nominal Spread (%)	Spread comparison Zero volatility spread (%)	Option adjustment Spread (%)
1	2.49	1.96	−0.01
2	3.74	1.53	0.37
3	2.16	1.72	0.71
4	1.83	1.39	−0.33

Required:
Advise on the most appropriate security for the investment analyst to invest in.   (5 marks)
                                                                                        (Total: 20 marks)

QUESTION TWO

(a)   Explain the meaning of the following terms as used in private equity:

(i)   An angel investor.   (1 mark)

(ii)   An incubator.   (1 mark)

(iii)   Mezzanine capital.   (1 mark)

(iv)   Acceleration.   (1 mark)

(b)   The following are the details of Gemini Fund with a vintage year of 2017 and a committed capital of Sh.1.95 billion:

Venture capital for Gemini Fund

Year	Called-Down Sh."million"	Management fee Sh."million"	Operating results Sh."million"
2017	300	4.5	(100)
2018	250	8.3	550
2019	750	19.5	750

Additional information:

1.   The distribution waterfalls calls for a 20% carried interest when Net Asset Value (NAV) before distribution exceeds committed capital.

2.   The Gemini Fund is considering a new investment in Orion Company Limited. Orion Limited is a start-up Biotechnology Company seeking Sh.90million in venture capital financing. Orion's founders believe that, based on the company's new drug pipeline, a company value of Sh.3 billion is reasonable in five years.

3.   The management at Gemini Fund views Orion Limited as a risky investment (15% risk of failure) and is using a discount rate of 40%.

Required:

(i)   Percentage management fee for Gemini Fund for the year 2019.   (2 marks)

(ii)   The amount of carried interest for Gemini Fund for the year 2019.   (4 marks)

(iii)   The Orion Limited's post money valuation using single period Net Present Value (NPV) method.   (2 marks)

(iv)   Assuming that Orion founders will hold 2.5 million ordinary shares of Orion Limited and that the post valuation is Sh.900 million, determine the price per share for the venture capital.   (3 marks)

(c)   Amita Adeyo is a real estate analyst and has gathered the following data relating to a real estate proposal:

1.   The market value of the land using comparables is Sh.12,500,000.
2.   The total area is 2.5 million square feet.
3.   The replacement cost and developer's profit is Sh.6.30 per square foot.
4.   Curable deterioration is Sh.100,000.
5.   The total economic life is 75 years and effective age is 15 years.
6.   All estimated obsolescence costs are Sh.500,000.

Required:

Determine the estimated value of the real estate proposal using the cost approach.   (5 marks)

(Total: 20 marks)

QUESTION THREE

(a)   Describe five key attributes of both timberland and farmland as types of alternative investments.   (5 marks)

(b)   Assess five control mechanisms used by hedge funds to align interest of the managers of portfolio companies with the hedge fund's interest.   (5 marks)

(c)   A global hedge fund has a value of Sh.100 million at the beginning of the year. The fund charges a 2% management fee based on assets under management (AUM) at the end of the year and a 20% incentive fee with a soft hurdle rate of London Interbank Offered Rate (LIBOR) plus 2.5%. Incentive fees are calculated net of management fees. The relevant LIBOR rate is 2.5% and the fund's value at the end of the year before fees is Sh.120 million.

Required:

The net return to investors.   (3 marks)

(d)   Joram Muhia believes he has identified an arbitrage opportunity for a commodity as indicated by the information below:

Commodity price and interest rate information:

Spot price for commodity   Sh.120
Futures price for commodity expiring in 1 year   Sh.125
Interest rate for one year   8%

Required:

(i)   Describe the transactions necessary to take advantage of this specific arbitrage opportunity.   (2 marks)

(ii)   Calculate the arbitrage profit.   (2 marks)

(iii) Propose three market imperfections that could limit Joram's ability to implement this arbitrage strategy.

(3 marks)
(Total: 20 marks)

QUESTION FOUR

(a)   Explain two advantages and two disadvantages of issuing mezzanine debt.   (4 marks)

(b)   A collateralised debt obligation (CDO) structure has Sh.100 million in issue which is the collateral:

Tranche	Par value (Sh."million")	Coupon rate
Senior	80	LIBOR + 70 basis point
Mezzanine	10	10 year Treasury bond rate + 200 basis point
Equity	10	–

The collateral consist of all bonds that mature in 10 years and that the coupon rate for every bond is the 10 year Treasury bond rate plus 400 basis point.

The manager of the trust has entered into an interest rate swap under which the trust will pay a fixed rate each year equal to the 10 year Treasury rate plus 100 basis point and receive LIBOR. The notional amount of the interest rate swap is the par value of the senior tranche.

The 10 year Treasury bond rate at the time this CDO is issued is 7%. The CDO's management fee is Sh.500,000.

Required:

(i)   The arbitrage profit from this collateralised debt obligation (CDO) transaction.   (8 marks)

(ii)   Describe two motivations of creating a collateralised debt obligation in (b) (i) above.   (2 marks)

(c)   Faida Consultants is reviewing various mortgage backed securities (MBS) for its clients. The consultants are interested in calculation of a single monthly mortality (SMM) rate. The consultants use the Public Securities Association (PSA) standard prepayment benchmark. They also calculate the sum for month 22, assuming a 140 PSA to be 0.37%. They also calculate the SMM for month 200, assuming a 90 PSA to be 0.46%.

Required:

Justify the validity of their estimates for months 22 and 200.   (6 marks)
(Total: 20 marks)

QUESTION FIVE

(a)   Evaluate three factors that could affect prepayment behavior for mortgage backed securities (MBS).   (6 marks)

(b)   Nyumba Investment Company is a member-owned property investment firm whose main objective is to invest in domestic homes. The company has partnered with a local bank for financing of its two projects.

The following housing units are complete and available for sale:

Bungalows units	Sh.
BY-A	3,980,000
BY-B	8,540,000
BY-C	9,750,000

Additional information:

1. The gross project value is Sh.1.565 billion.
2. The loan finance available is Sh.867 million
3. The units will be paid at 133% of the rate at which revenue will be received.

Required:

The release price for each house unit. (4 marks)

(c) Ayub Kimeu is analysing two specific apartments. Blue Oaks apartment and Green Ridge apartment. Both apartments are next to each other and were built 10 years ago by the same construction company. The apartments have the same number of units and amenities. The apartments are also managed by the same property management company.

The following information relates to the two apartments:

	Blue Oaks Apartment	Green Ridge Apartment
Annual net operating income end of year 1	Sh.2,187,500	Sh.2,125,000
Loan to value (LTV) ratio	75.0%	70.0%
Loan interest rate	4.00%	3.50%
Monthly debt service	Sh.113,621	Sh.101,493
Loan term	20 years	20 years
Expected sale price in 10 years	Sh.30 million	Sh.30 million
Principal owed at the end of 10 years	Sh.11,222,397	Sh.11,144,755
Asking price	Sh.25 million	Sh.25 million

A pension fund can buy one or both apartments provided they meet the minimum criteria of a debt service coverage ratio of at least 1.50 times and a levered internal rate of return (IRR) of at least 17.5%.

Required:

Determine whether one or both apartments meet the minimum criteria for investment. (10 marks)

(Total: 20 marks)

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Present Value Interest factor of 1 Received at the End of *n* Periods at *r* Percent:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6944	0.6504	0.6400	0.5917
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050	0.2326	0.1789	0.1678	0.1226
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.0935	0.0610	0.0550	0.0330
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079	0.0649	0.0397	0.0352	0.0195
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514	0.0261	0.0135	0.0115	0.0053
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382	0.0181	0.0088	0.0074	0.0031
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0349	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116	0.0042	0.0016	0.0012	*
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	*	*
36	0.6989	0.4902	0.3450	0.2437	0.1727	0.1227	0.0875	0.0626	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065	0.0048	0.0014	*	*	*
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	*	*	*
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	*	*	*	*

Present Value Interest factors for Annuity of 1 Discounted at *r* Percent for *n* Periods:

$$PVIFA_{r,n} = [1 - 1/(1+r)^n]/r$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4568	1.4400	1.3609
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9813	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5887	2.4043	2.3616	2.1662
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6893	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.7122	4.5638	4.4226	4.2883	4.1604	4.0386	3.6046	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7988	4.6389	4.4873	4.3436	3.8372	3.4212	3.3289	2.9247
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6065	4.0310	3.5655	3.4631	3.0190
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0188	4.8332	4.1925	3.6819	3.5705	3.0915
11	10.368	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.255	10.575	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.4392	3.8514	3.7251	3.1903
13	12.134	11.348	10.635	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	4.5327	3.9124	3.7801	3.2233
14	13.004	12.106	11.296	10.563	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	4.6106	3.9616	3.8241	3.2487
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0607	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5755	4.6755	4.0013	3.8593	3.2682
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8514	8.3126	7.8237	7.3792	6.9740	6.6039	6.2651	5.9542	5.6685	4.7296	4.0333	3.8874	3.2832
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7291	6.3729	6.0472	5.7487	4.7746	4.0591	3.9099	3.2948
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.3719	8.7556	8.2014	7.7016	7.2497	6.8399	6.4674	6.1280	5.8178	4.8122	4.0799	3.9279	3.3037
19	17.226	15.678	14.324	13.134	12.085	11.158	10.336	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	4.8435	4.0967	3.9424	3.3105
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8181	9.1285	8.5136	7.9633	7.4694	7.0248	6.6231	6.2593	5.9288	4.8696	4.1103	3.9539	3.3158
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2922	8.6487	8.0751	7.5620	7.1016	6.6870	6.3125	5.9731	4.8913	4.1212	3.9631	3.3198
22	19.660	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.4424	8.7715	8.1757	7.6446	7.1695	6.7429	6.3587	6.0113	4.9094	4.1300	3.9705	3.3230
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.5802	8.8832	8.2664	7.7184	7.2297	6.7921	6.3988	6.0442	4.9245	4.1371	3.9764	3.3254
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.7066	8.9847	8.3481	7.7843	7.2829	6.8351	6.4338	6.0726	4.9371	4.1428	3.9811	3.3272
25	22.023	19.523	17.413	15.622	14.094	12.783	11.654	10.675	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0971	4.9476	4.1474	3.9849	3.3286
30	25.808	22.396	19.600	17.292	15.372	13.765	12.409	11.258	10.274	9.4269	8.6938	8.0552	7.4957	7.0027	6.5660	6.1772	4.9789	4.1601	3.9950	3.3321
35	29.409	24.999	21.487	18.665	16.374	14.498	12.948	11.655	10.567	9.6442	8.8552	8.1755	7.5856	7.0700	6.6166	6.2153	4.9915	4.1644	3.9984	3.3330
36	30.108	25.489	21.832	18.908	16.547	14.621	13.035	11.717	10.612	9.6765	8.8786	8.1924	7.5979	7.0790	6.6231	6.2201	4.9929	4.1649	3.9987	3.3331
40	32.835	27.355	23.115	19.793	17.159	15.046	13.332	11.925	10.757	9.7791	8.9511	8.2438	7.6344	7.1050	6.6418	6.2335	4.9966	4.1659	3.9995	3.3332
50	39.196	31.424	25.730	21.482	18.256	15.762	13.801	12.233	10.962	9.9148	9.0417	8.3045	7.6752	7.1327	6.6605	6.2463	4.9995	4.1666	3.9999	3.3333

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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

WEDNESDAY: 27 November 2019.　　　　　　　　　　　　　　**Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE
(a)　Examine four forms of regulations imposed by the market regulator in your country to ensure that systematic risks associated with alternative investments are minimised.　　　　　　　　(4 marks)

(b)　Highlight four objectives of including real estate to an investment portfolio as an alternative asset class.　　(4 marks)

(c)　Utopia Investment Bank recently hired you to be its portfolio assistant manager. One of your key client whose account you are managing has shown interest in diversifying his portfolio through investment in a commercial building real estate investment trust (CREIT). The following information regarding the CREIT you have recommended is as follows:

	Sh."000"
Estimated 12 months net operating income (NOI)	76,000
Funds from operation for the year ended 31 December 2018	66,500
Cash and cash equivalents	61,750
Accounts receivable	33,250
Non-cash rents	4,750
Debt and other liabilities	380,000
Recurring maintenance costs	14,250
Expected annual dividend to be paid in the year 2019	4,750

Additional information
1.　The number of outstanding ordinary shares amounted to 9.5 million.
2.　The dividend growth rate in the year 2020 and 2021 is expected to be 2% per annum and thereafter grow at 1% per annum from 2022 into perpetuity.
3.　The assumed capitalisation rate is 7.5%.
4.　The commercial building subsector average price-to-funds from operation (P/FFO) is 10 times while that of price-to-average funds from operation (P/AFFO) is 14 times.

　　Assume your cost of equity is 9% while the risk-free rate is 2%.

Required:
The value of CREIT using the following approaches:

(i)　The net asset value (NAV).　　　　　　　　　　　　　　　　　　　(3 marks)

(ii)　The price-to-funds from operation (P/FFO).　　　　　　　　　　　　(3 marks)

(iii)　The price-to-average funds from operation (P/AFFO).　　　　　　　　(3 marks)

(iv)　Through discounted cash flow (DCF) method.　　　　　　　　　　　(3 marks)
　　　　　　　　　　　　　　　　　　　　　　　　　　　　(Total: 20 marks)

QUESTION TWO

(a)   (i)   Propose two distribution waterfall methods that could be applied to facilitate the flow of accrued interest from a general partner to a limited partner in relation to private equity.   (4 marks)

      (ii)   Zimera Fund is a private equity firm with interests in agricultural and building constructions. The firm has recently raised Sh.100 million capital with carried interest rate of 20%. Out of this fund, an investment to the tune of Sh.40 million is made and later in the year the firm will exit the investment and earn a profit of Sh.22 million.

      Required:
      Determine whether the general partner receives any carried interest under the waterfall distribution method.
      (4 marks)

(b)   Describe four factors that could have contributed to the growth of the global distressed debt market in the recent past.
  (4 marks)

(c)   Two financial analysts were tasked to analyse a potential investment in a leveraged buyout (LBO) of Rich Capital Limited. They seek to assess the expected gain if they elect to purchase all the preference shares and 90% of the ordinary shares in the LBO.
Details of the LBO include the following:
- The buyout requires an initial investment of Sh.10 million.
- Financing of the deal includes Sh.6 million in debt, Sh.3.6 million in preference shares that promises a 15% annual return paid at exit and Sh.0.4 million in ordinary shares. The expected exit value in six years is Sh.15 million with an estimated reduction in debt of Sh.2.8 million over the six years prior to exit.

Required:
The multiple of expected proceeds at exit to invested funds for the LBO investment.   (5 marks)

(d)   The coupon curve of prices for passthrough security for some months is as follows:

Coupon (%)	Price (Sh.)
7	94.00
8	97.06
9	99.50
10	102.60
11	105.25
12	106.19

Required:
The coupon curve duration for the 10% coupon passthrough.   (3 marks)

(Total: 20 marks)

QUESTION THREE

(a)   Evaluate three forms of internal credit enhancement as used in asset backed securities (ABS).   (6 marks)

(b)   Suggest two reasons why financial institutions originate synthetic balance sheet collateralised debt obligations (CDOs).   (4 marks)

(c)   The following information relates to property B which is eventually sold in year 10:

	Sh.
Purchase price	4,570,000
Expected net selling price	7,760,500
Expected gain on sale	4,710,500
Accumulated depreciation	1,520,000
Mortgage balance outstanding	1,140,000
Tax on depreciation recapture	30%
Tax on capital gains	5%

Required:
The after-tax equity reversion of property B.   (4 marks)

(d) As a pension manager with Faraja Endowment Fund, you have made an investment in a venture capital fund known as "Hekima Fund" for 3 years commencing 2016. You have committed a capital of Sh.876 million and the performance of Hekima Fund is as shown below:

Year	Called down Sh."million"	Management fee Sh."million"	Operating results Sh."million"
2016	135	0.55	–95
2017	112	0.87	135
2018	337	1.39	455

You are also informed that the distribution waterfall calls for a 20% carried interest when the Net Asset Value (NAV) before distribution exceeds the committed capital.

Required:

(i) Calculate the year 2018 percentage management fee of the Hekima Fund. (3 marks)

(ii) Determine the net asset value (NAV) of the fund for the year 2018. (3 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Explain three classes of protective covenants provided in a venture capital arrangement aimed at safeguarding the investors' interests. (3 marks)

(b) (i) Describe three types of participants in the commodities market. (3 marks)

(ii) A pension fund seeks to gain long exposure to commodities using the swap market. They analyse the performance of a long position in a commodity index total return swap having monthly resets and a notional amount of Sh.25 million. Selected data on the commodity index for the year 2019 is as presented below:

Reference date	Index level
April (swap initiation)	3042.35
May	3282.23
June	3225.21

The settlement date was June 2019.

Required:
The amount to be received or paid by the party that is long in the commodity index total return swap.

(3 marks)

(c) A pool of mortgage pass-through securities is used as a collateral for collateralised mortgage obligation (CMO) selling at a premium. One tranche in the deal, Tranche X is selling at a discount and another tranche Y is selling at a premium.

Required:

(i) Explain why a slowdown in prepayments will tend to increase the value of the collateral. (2 marks)

(ii) Compare and contrast the effect of a slowdown in prepayments on the value of tranche X and Y respectively. (2 marks)

(d) As a financial analyst for Liz Fund Managers, you have gathered the following data on a collateralised mortgage obligation (CMO) structure using Monte Carlo Simulation Model based on 12% volatility:

	Option adjusted spread (OAS) Basis points (BPS)	Z-spread Basis points (BPS)	Effective duration
Collateral tranche	90	130	8.0
PAC I A	60	70	2.0
PAC I B	80	90	4.0
PAC I C	40	130	6.0
PAC I D	40	160	10.0
PAC II A	90	180	5.0
PAC II B	30	300	7.0
Support A S1	40	190	12.0
Support A S2	60	210	15.0

Where: PAC – Planned Amortisation Class

Required:

(i) Calculate the option cost for PAC I D, PAC II B and Support A S2. (3 marks)

(ii) Identify the PAC tranches that appear expensive in the above deal on a relative value basis. (2 marks)

(iii) Despite PAC II B low OAS of 30 basis points, explain why a yield buyer may be persuaded to purchase the PAC II B. (2 marks)

(Total: 20 marks)

QUESTION FIVE

(a) In relation to hedge funds:

(i) Assess three difficulties which could be experienced in applying traditional portfolio analysis to value hedge funds. (6 marks)

(ii) Argue three cases in favour of hedge fund replication strategy to manage hedge funds. (6 marks)

(b) The current cash price of one barrel of Brent Crude Oil is Sh.10,000 while the three month future price is Sh.9,800 per barrel. The annual cost of funding is 4% and the annual storage cost is 5%.

Required:
The convenience yield. (2 marks)

(c) An analysts observes the following futures prices for an agricultural commodity trading on a global futures market:

Commodity	January 2020	February 2020	March 2020	April 2020
30 December 2019	57.98	61.04	62.09	62.35
31 January 2020		68.35	67.92	68.74
28 February 2020			61.10	61.41
31 March 2020				60.57

Required:
Calculate the following:

(i) Futures return for January 2020. (2 marks)

(ii) Spot return for February 2020. (2 marks)

(iii) The roll return for March 2020. (2 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,n} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.6475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 23 May 2019.   **Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Explain four buy side participants in the alternative investments environment.   (4 marks)

(b) Examine four characteristics of mezzanine debt.   (4 marks)

(c) The following financial data was extracted from the books of Umoja Shopping Mall for the year ended 31 December 2018:

	-Sh."000"
Net Operating Income (NOI) .	80,000
Cash and cash equivalents	20,000
Accounts receivable	15,000
Total debt	250,000
Sundry creditors	50,000
Non-cash rent	2,000
Full-year acquisition adjustments	1,000
Land held for future development	10,000
Prepayments	5,000

Additional information:
1. Growth of NOI for the year 2019 is projected to be 1.25%.
2. Capitalisation rate based on recent comparable transaction is 8.0%.
3. Number of ordinary shares outstanding is 15,000,000.

Required:
The net asset value per share (NAVPS) for the Umoja Shopping Mall.   (7 marks)

(d) Valley Ltd. is an agri-business company. The founders believe they can sell the company for Sh.40 million in 5 years time. The founders require Sh.5 million in capital now and they currently hold 1 million ordinary shares. The venture capital decides that given the high risk of this company, the discount rate of 40% is appropriate.

Required:

(i) The pre-money valuation for the venture capital.   (1 mark)

(ii) The post-money valuation for the venture capital.   (1 mark)

(iii) The ownership fraction.   (1 mark)

(iv) The price per share using the net present value (NPV) method with a single financing round.   (2 marks)

(Total: 20 marks)

QUESTION TWO

(a) Highlight three benefits of farmland as an alternative asset.   (3 marks)

(b) Assume a piece of farmland costs Sh.110,000 per acre and an investor purchases 10 acres of the land. The investor finances 75% through bank loan and puts 25% equity in the deal. The interest rate for the loan is 5%.

Additional information:
1. The investor leases the farm to a local farmer for Sh.12,000 per acre per year earning a return of Sh.120,000 per annum.
2. Property taxes amount to Sh.30,000 per annum.
3. Insurance amounts to Sh.10,000 per year.

Required:

(i)   Return on equity (ROE) on the farmland.   (3 marks)

(ii)   Operating return on asset (ROA) on the farmland.   (3 marks)

(c)   A property was let for a five year term, three years ago at Sh.400,000 per year. Rent review occurs every five years. The estimated rental value in the current market is Sh.450,000 and the risks yield on comparable fully let properties is 5%. The incremental rent is to be discounted at a rate of 6%.

Required:

Estimate the value of the property using the layer method.   (4 marks)

(d)   The following information relates to a Leveraged Buyout (LBO) transaction valued at Sh.800 million:

Additional information:

1.   Exit occurs in seven years at a projected multiple of 1.8 of the company's original cost.
2.   The LBO is financed through a debt to equity ratio of 65% and 35% respectively.
3.   The Sh.280 million equity is composed of:
   -    Sh.200 million in preference shares held by the private equity firm.
   -    Sh.75 million in equity held by the private equity firm.
   -    Sh.5 million in equity held by management equity participation.
4.   Preference shares are guaranteed at 14% compound annual return payable at exit.
5.   The equity of the private equity (P/E) firm is promised 90% of the firm's residual value at exit after the creditor's and preference shares are paid.
6.   Management equity participation receives 10% balance.
7.   By exit, the company will have paid Sh.300 million of the initial Sh.520 million in debt using operating cash flows.

Required:

The payoff multiple for the equity claimants (private equity).   (7 marks)
     (Total: 20 marks)

QUESTION THREE

(a)   Discuss two exit strategies available for private equity investors.   (4 marks)

(b)   (i)   Describe three types of risks that could be faced by hedge fund managers.   (3 marks)

      (ii)   Tom Ltd., a fund of hedge funds, has the following fee structure:

-   2/20 underlying fund fees with incentive fees calculated independently.
-   Tom Ltd. fees are calculated net of all underlying fund fees.
-   1% management fee (based on year end market value).
-   10% incentive fee calculated net of management fee.
-   The fund and all underlying funds have no hurdle rate or high-water mark (HWM) fee conditions.

In the latest year, Tom Ltd.'s funds value increased from Sh.100 million to Sh.133 million before deduction of management and incentive fees of the fund or underlying funds.

Required:

The total fee earned by all the funds in the aggregate.   (7 marks)

(c)   Rachel Wamae owns a newly issued government agency fixed rate pass through mortgage backed security (MBS) and wants to evaluate the sensitivity of its principal cash flow to the following interest rate scenario:

Interest rates instantaneously decline by 250 basis points for all maturities, remain there for one year, and then,

Interest rates instantaneously increase 350 basis points for all maturities and remain there for the next year.

Currently, the MBS is priced close to par and the yield curve is flat. Rachel does not expect the shape of the yield curve to change during the interest rate scenario.

Rachel also wants to evaluate the price sensitivity of her MBS to changes in interest rates. She knows that modified duration and effective duration are two possible measures she could use to evaluate price sensitivity.

Rachel also owns a newly issued government agency collateralised mortgage obligation interest only (IO) security.

Required:

(i)   Discuss the reasons why the MBS principal cash flows change.   (2 marks)

(ii)   Justify with reasons the duration measure that Rachel Wamae should use to evaluate the price sensitivity of her MBS.   (2 marks)

(iii) Explain whether the interest only, IO, security price increases or decreases in the first year of the interest rate scenario described above.   (2 marks)

(Total: 20 marks)

QUESTION FOUR

(a)   Summarise four characteristics that differentiate the commodity indices from other alternative investment indices.   (4 marks)

(b)   A fund manager takes a fully collateralised long futures position in nearby coffee futures contract at the quoted futures price of Sh.865.0. Three months later, the entire futures position is rolled when the near term futures price is Sh.877.0 and the further term futures price is Sh.883.0. During the three month period between the time that the initial long position was taken and the rolling of the contact, the collateral earned an annualised rate of 0.60%.

Required:
The three month's total return on the coffee futures trade.   (5 marks)

(c)   Bomboo Ltd. is an all-equity financed firm. After a recent re-organisation, the company is considering issuing a debt in form of a collateralised mortgage obligation (CMO). The issuer is considering the two CMO structures as highlighted below:

Structure 1

Tranche	Par amount Sh. "million"	Coupon rate (%)
A	150	6.50
B	100	6.75
C	200	7.25
D	150	7.75
E	100	8.00
F	500	8.50

Structure 2

Tranche	Par amount Sh. "million"	Coupon rate (%)
A	150	6.50
B	100	6.75
C	200	7.25
D	150	7.75
E	100	8.00
F	200	8.25
G	300	?

Tranches A to E are a sequence of planned amortisation class (PAC), tranche F is a PAC 2 and tranche E is a support tranche without a schedule.

In Structure 2, tranche G is created from tranche F in Structure 1.

Required:

(i)   Determine the coupon rate for tranche G assuming that the combined coupon rate for tranches F and G in Structure 2, is 8.5%.   (4 marks)

(ii)   Explain the effect on the value and average life of tranches A-E including the PAC 2 in Structure 2.   (2 marks)

(iii) Explain whether there is any difference in the average life variability of tranche G in Structure 2 and tranche F in structure 1.   (2 marks)

(d)   An investments analyst is considering the following asset backed security (ABS) structure:

Tranche	Amount Sh."million"
Senior tranche	170
Subordinate tranche A	50
Subordinate tranche B	20
	240

The amount in the pool are worth Sh.280 million.

Required:

(i)   Amount of overcollateralisation.   (1 mark)

(ii)   Amount of losses that the senior tranche investors begin to lose money.   (2 marks)

(Total: 20 marks)

QUESTION FIVE

(a)   Discuss four types of mortgage designs in the context of mortgage backed securities (MBS).   (4 marks)

(b)   A tranche of a mortgage backed security (MBS) has been split to create a floater with a principal of Sh.64,583,333 and an inverse floater of Sh.12,916,667.

The tranche has a coupon rate of 8.5%

Required:

(i)   The capitalisation rate for the inverse floater when the coupon rate for the floater is 91-day treasury bill plus 1%.   (4 marks)

(ii)   The capitalisation rate for the floater when the coupon rate is 91-day treasury bill plus 1% and a floor is imposed on the inverse floater of zero.   (2 marks)

(c)   Describe four loan level call protection mechanism that cushions an investor of a commercial mortgage backed security (CMBS) from exposure to loan prepayment risks.   (4 marks)

(d)   Fredrick Onyango owns a mortgage pass through in which the remaining mortgage balance at the beginning of the month is Sh.290 million and the Conditional Prepayment Rate (CPR) is 6%. The scheduled principal payment is Sh.3 million.

Required:

(i)   The single-monthly mortality rate (SMM).   (2 marks)

(ii)   The estimated prepayments.   (2 marks)

(iii)   The SMM for month 5 assuming a benchmark of 100.   (2 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,n} = \sum_{i=1}^{n} \frac{1}{(1+r)^i} = \frac{1- \frac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7731	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 29 November 2018.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a)   Explain five characteristics of real estate as an alternative investment class.   (5 marks)

(b)   The following information relates to a certain office building in Naro town and which Kangaro Financial Services (KFS) is considering for valuation:

	Sh."000"
Gross potential rental income	700,000
Insurance and taxes	52,000
Utilities	36,000
Repairs and maintenance	46,000
Depreciation	80,000
Interest on proposed financing	36,000

Additional information:
1.   Vacancy and collection losses is estimated at 4%.
2.   Recently, there have been two office buildings sold in the same area:
   - The first building had a net operating income of Sh.1,000,000 and was sold for Sh.8,000,000.
   - The second building had a net operating income of Sh.450,000 and was sold for Sh.3,200,000.

Required:

(i)   The net operating income (NOI) for the office building.   (5 marks)

(ii)   The appraised price of the office building using the income approach.   (5 marks)

(c)   An asset management firm is reviewing the following mortgage pool:

Loan	Outstanding Mortgage balance Sh."000"	Mortgage rate (%)	Months remaining
1	215,000	6.75	200
2	185,000	7.75	185
3	125,000	7.25	192
4	100,000	7.00	210
5	200,000	6.50	180

Required:

(i)   The weighted average coupon (WAC) rate for the mortgage pool.   (3 marks)

(ii)   The weighted average maturity (WAM) for the mortgage pool.   (2 marks)
                                                                                    (Total: 20 marks)

QUESTION TWO

(a)   Explain the term "J-curve effect" as used in private equity valuation.   (2 marks)

(b)   Highlight three differences between a "buyout investment" and a "venture capital investment".   (3 marks)

(c)   Examine four roles of third market and fourth market in alternative investments.   (4 marks)

(d)   A private equity fund has the following information about the yearly capital calls, operating results and distributions:

Amount (Sh."million")

Year	2012	2013	2014	2015	2016	2017
Capital called down	50	15	10	25	10	5
Realised results	0	0	10	35	40	80
Unrealised results	-5	-15	15	10	15	25
Distributions	-	-	-	25	45	75

Additional information:
1.   The management fee is set at 2%.
2.   The carried interest is 20%.
3.   The fund's committed capital is Sh.125 million.

Required:
The fund's net internal rate of return (IRR).   (8 marks)

(e)   The following information relate to a venture capital deal.

Terminal value (at time of exit)	Sh.5,000,000
Time to exit event	4 years
Amount of investment	Sh.1,000,000
Discount rate used by investors	25%
Number of existing shares owned by the entrepreneurs	200,000

Required:
The price per share of the venture capital deal.   (3 marks)
(Total: 20 marks)

QUESTION THREE
(a)   Distinguish between "contango" and "backwardation" in relation to commodities.   (2 marks)

(b)   An asset is priced at Sh.5,000. The risk-free rate is 9%. Futures contract on the asset expires in 45 days.

Assume a 365-day year.

Required:
(i)   The futures price assuming that the underlying asset has no storage cost, cash flow or convenience yield.   (2 marks)

(ii)   The futures price assuming that the future value of storage cost on the underlying asset at expiration is Sh.500.   (2 marks)

(iii)   The futures price assuming that the future value of positive cash flows on the underlying asset is Sh.150.   (2 marks)

(c)   An index provider has created a new investable index that tracks the hedge fund industry. Any fund that follows a long/short strategy can enter the index. The index provider places new constituents in the index at the end of each year and incorporates the new fund's track record in the database.

In relation to the above statement, evaluate three biases inherent in the hedge fund databases that might distort the historical performance of the index.   (6 marks)

(d)   Cool Breeze Capital (CBC) is considering a leveraged buyout (LBO) of Optimax Capital which has been experiencing poor operating results over the last few years. The revenue and earnings before interest tax depreciation and amortisation (EBITDA) for Optimax Capital have been declining rapidly but CBC believe it has found a new management team that will stabilise Optimax Capital.

Optimax Capital currently has EBITDA of Sh.250 million and CBC believes that the new management team could keep EBITDA constant for the next five years.

CBC has obtained debt financing of Sh.750 million at an interest rate of 10% and Optimax Capital expects working capital to be a source of funds at a cost of Sh.6 million per year. It also requires capital expenditure of Sh.35 million per year. The corporation tax rate is 30%.

CBC plans to sell Optimax Capital after five years at an enterprise value to EBITDA multiple of 6.0x.

Additional information:
1. Assume that excess cash is not used to repay debt and instead accumulates on the balance sheet.
2. There are no transaction fees, zero minimum cash required and the property, plant and equipment on the balance sheet remain constant for the next five years.

Required:
The purchase price required for CBC to obtain a 3.0x multiple of invested capital (MOIC). (6 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Onesmus Nyandiko is the manager of a portfolio containing mortgage pass-through securities. He is reviewing output of his firm's analytical system for several pass-through securities that are in the portfolio. Below is a portion of the report for three pass-through securities:

Price based on an assumed interest rate volatility of:

Pass-through (%)	11	13	15	16
Security 1	100	98	95	93
Security 2	92	90	88	87
Security 3	102	104	106	107

Required:
Comment on whether there is an error in the analytical system. (3 marks)

(b) Describe two ways in which a credit default swap could be settled. (4 marks)

(c) Explain the following tranches of a collateralised mortgage obligation (CMO):

   (i) Sequential pay tranche. (1 mark)

   (ii) The accrual tranche. (1 mark)

   (iii) The planned amortisation class (PAC) tranche. (1 mark)

   (iv) The support tranche. (1 mark)

(d) A collateralised debt obligation (CDO) has a Sh.100 million structure. The collateral consists entirely of bonds with 10 years remaining until maturity and a coupon rate which is equal to the 10 years treasury rate plus 300 basis point. The senior tranche represent Sh.65 million and carries a floating coupon rate equal to London Interbank Offered Rate (LIBOR) plus 60 basis point. There is Sh.7 million mezzanine tranche and has a fixed coupon equal to the treasury rate at origination plus 100 basis point. The manager of the trust has entered into an interest rate swap under which the trust will pay an annual fixed rate equal to the treasury rate plus 80 basis points and receive LIBOR. The notional amount for this swap is Sh.65 million.

The 10 year treasury rate is 6% at the time of origination.

Required:
Determine the return of the equity tranche that is created. (9 marks)

(Total: 20 marks)

QUESTION FIVE
(a) Discuss four common features of alternative investments. (4 marks)

(b) Describe two categories of infrastructure investments as a form of alternative investments. (2 marks)

(c)   Explain the following terms in the context of private equity:

      (i)   Equity dry powder.   (1 mark)

      (ii)   Mezzanine debt.   (1 mark)

      (iii)   Distribution waterfall.   (1 mark)

(d)   Faida Hedge Fund has Sh.100 million assets under management (AUM) at the start of year 1. The Fund grows to Sh.120 million at the end of year 1. At the end of year 2, the value of the fund had declined to Sh.90 million. However, the value of the fund increased to Sh.140 million at the end of year 3.

      The fund charges a management fee of 2% based on AUM and a 20% incentive fee with a high-watermark (HWM) provision for incentive fees.

Required:
Return to investors at the end of each year.   (6 marks)

(e)   A government sponsored mortgage backed security (MBS) is a 9% passthrough security issued on 1 March 2017 with a remaining term of 359 months. The 1 June 2018 and 1 July 2018 pool factors are 0.85150625 and 0.84732282 respectively.

Required:
The prepayment speed for the month of June 2018 using Public Securities Association (PSA).   (5 marks)
                                                           (Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,t} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 24 May 2018.   **Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Summarise three reasons why many private equity sponsors tend to favour mezzanine financing over high-yield funding. (3 marks)

(b) Eliud Mulee inherited an apartment building. He initially intended to keep the building, but his lawyer suggested that he should consider selling the building and buy some undeveloped land at the outskirts of the city. The owner of the land had planned to build a shopping mall but now he is being forced to sell the land at a price below its appraised value.

Mulee's lawyer made the following comments:

1. The high occupancy rate of your apartment building exceeds the occupancy rate of comparable local apartment buildings. As a result, the apartments will not have much potential for price appreciation.

2. Although the investment in the undeveloped land will not provide immediate cash flow, its long-term potential for price appreciation is significant because one can develop a shopping mall on the land.

Required:
Critique each of the above statements. (4 marks)

(c) An alternative investment analyst gathers the following values for distributions, contributions and net asset value (NAV) for a Ugandan private equity fund named Fox Fund 1 that belongs to the vintage year 2011:

Year	2011	2012	2013	2014	2015	2016	2017
Fox Fund 1 (Sh."million")	–200	–800	200	–2,000	–600	2,000	3,500

Positive numbers correspond to the years in which investors received net distributions while the negative numbers correspond to years in which investors made net contributions. The figure for 2017 corresponds to the net asset value at the end of that year.

Required:
Compute the following for the fund:

(i) Interim internal rate of return. (3 marks)

(ii) The total value to paid-in ratio. (2 marks)

(iii) The distribution to paid-in ratio. (2 marks)

(iv) The residual value to paid-in ratio. (2 marks)

(d) Samuel Mwangi has invested in several real estate holdings in a country with a capital gains tax rate of 30%. One of these holdings is land with a current market value of Sh.15 million. He intends to utilise its value to generate liquidity. Samuel is considering monetising his property either through mortgage financing or sale and lease back.

The property has a cost basis for tax purposes equal to 15% of its current market value. He can achieve a loan-to-value ratio of 75% through a mortgage financing at an interest rate of 8%. Lease payments and mortgage financing are both deductible for tax purposes. He wants to determine how much liquidity each method will generate upon closing.

Required:
Calculate the initial net proceeds if Samuel opts to use:

(i) Mortgage financing method. (2 marks)

(ii) Sale and lease back method. (2 marks)

(Total: 20 marks)

QUESTION TWO

(a) In the context of participants in the alternative investments market, evaluate four advantages of separately managed accounts (SMAs) relative to mutual funds. (4 marks)

(b) Explain three factors that could affect prepayments in a mortgage pass-through security. (3 marks)

(c) In relation to asset backed securities (ABS), differentiate between "prepayment tranching" and "credit tranching". (2 marks)

(d) An alternative investment firm is considering equity investments in real estate. The two options under consideration are as illustrated below:

Option 1: Investment in a public real estate investment trust (REIT).
Option 2: Equity investment in a public real estate operating company (REOC)

Option 1: REIT

Recent net operating income (NOI)	Sh.140 million
Non-cash rents	Sh.5 million
Full year adjustment for acquisition	Sh.5 million
Other assets	Sh.50 million
Total liabilities	Sh.300 million
Current market price per share	Sh.125
Shares outstanding	15 million
Going in capitalisation rate	7.0%
Net operating income growth rate	2.5%

Option 2: REOC

Expected Adjusted Funds From Operations (AFFO) in year 8	Sh.13.5 million
Holding period	7 years
Present value of all dividends for 7 years	Sh.39.7 million
Shares outstanding	1.0 million
Capitalisation rate	7.0%
Growth rate from year 8	2.50%

Additional information:

1. The REOC terminal value at the end of seven years is to be based on a price-to-AFFO multiple of 12 times.

2. The real estate market expectations are that mortgage rates are likely to remain low for at least seven more years and the economy is expected to enjoy above average growth rate.

Required:

(i) Using the net asset value approach, determine whether the REIT identified in Option 1 is fairly priced. (3 marks)

(ii) Using the discounted cash flow approach, calculate the estimated value per share of Option 2. (3 marks)

(iii) Provide one reason why Option 2 would be preferred over Option 1. (1 mark)

(e) An asset management firm is reviewing various mortgage backed securities (MBS) and is interested in calculating the single monthly mortality (SMM) rates. The firm is using the Public Securities Association (PSA) standard prepayment benchmark.

Required:

(i) The SMM for month 22 assuming a 140PSA. (2 marks)

(ii) The SMM for month 200 assuming a 90 PSA. (2 marks)

(Total: 20 marks)

QUESTION THREE

(a) Discuss four factors that have contributed to the convergence of private equity and hedge fund strategies in the global markets. (4 marks)

(b) Cetric Mayfair hedge fund employs the following three hedge fund strategies:
1. Quantitative long/short fund.
2. Arbitrage/relative value fund.
3. Fund of funds

Required:
For each of the above hedge fund strategies, propose:

(i) The underlying assumptions. (3 marks)

(ii) The investment strategies. (3 marks)

(iii) The potential downside exposures. (3 marks)

(c) A portfolio consists of 100 credits, each having a notional value of Sh.10 million. An investor is interested in a tranche having the notional value of Sh.50 million with an attachment of 5% and a width of 2%. The spread is 150 basis points. The recovery rate is 40%. The tranche will not experience any loss until there are nine defaults.

Required:

(i) Calculate the amount paid by the protection seller to the protection buyer. (3 marks)

(ii) Calculate the amount paid by the protection buyer to the protection seller. (1 mark)

(d) A fund has invested in a two commodity portfolio, A and B, with a beginning value of Sh.100 million. Over the upcoming two periods, the return on commodity A will be 100% in period 1 and – 50% in period 2. The rate of return on commodity B will be 0% in period 1 and 0% in period 2.

The allocation to each commodity is 50%. The portfolio is rebalanced after each period.

Required:
Calculate the geometric return of the portfolio. (3 marks)
(Total: 20 marks)

QUESTION FOUR
(a) Explain the following terms as used in private equity investment:

(i) Carried interest. (1 mark)

(ii) Clawback clause. (1 mark)

(b) Discuss two uses of credit derivatives. (2 marks)

(c) The asset backed securities (ABS) market has grown in the past few years partly as a result of credit enhancements to ABS.

Required:

(i) In relation to the above statement, differentiate between a "letter of credit" and "early amortisation" (2 marks)

(ii) Explain to the investor the risk associated with relying exclusively on letter of credit and early amortisation. (2 marks)

(d) SCM Capital is a hedge fund with an initiator investment capital of Sh.100 million. The hedge fund charges a 2% management fee based on assets under management at year end and a 20% incentive fee. In its first year, SCM Capital has a 30% return. The fee structure specifies a hurdle rate of 5% and the incentive fee is based on returns in excess of the hurdle rate. The performance fee is calculated net of the management fee.

In the second year, the fund value declines to Sh.110 million. The fee structure in the second year includes the use of a high water mark (HWM). In the third year, the fund value increases to Sh.128 million. The fee structure in the third year includes the use of a HWM.

Required:
(i) Calculate the arithmetic mean annual return over the three-year period based on the fee structure specified above. (5 marks)

(ii) Calculate the total fee paid to SCM Capital over the three-year period. (1 mark)

(e) Simon Meso decided to sell one of his income producing properties in January 2018. He decided to use a direct capitalisation approach and a discounted cash flow approach to set the asking price for the property. The property information is provided below:

Property information

Capitalisation rate	13%
Mortgage:	none
Commissions	none

Year	Net Operating Income (Sh."000")
2018	43,300
2019	45,725
2020	43,271
2021	50,945

Required:

(i) Estimate the property's current value using the direct capitalisation method. (1 mark)

(ii) Discuss two shortcomings of the underlying assumptions and methodology of the direct capitalisation approach to valuation. (2 marks)

(iii) Calculate a discounted cash flow valuation of the property given that the property is sold at the end of year 2021. (3 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Outline one limitation of cash flow duration in the mortgage backed securities market (MBS). (1 mark)

(b) In relation to commodities, discuss three misinterpretations of the roll return. (3 marks)

(c) An investor of assets backed securities (ABS) and mortgage backed securities (MBS) is concerned that there is a possibility of interest rates declining in the near future.

Required:
Explain the effect of the following assuming interest rates decline as expected:

(i) The cash flows of home-equity ABS. (2 marks)

(ii) The cash flows of the automobile receivable ABS. (2 marks)

(d) An analyst gathers the following information for collateralised mortgage obligation (CMO) tranches:

Tranche	Option Adjusted Spread (basis points)	Z-Spread (basis points)	Effective duration
1	68	85	2.60
2	71	91	2.90
3	73	136	8.25

Required:
Determine the most expensive tranche. (4 marks)

(e) James Ochieng is considering investing in two bonds, A and B. Bond A has a duration of 5.6 years and a convexity of 38.2. Bond B has a duration of 7.3 years and a convexity of 38.2.

Required:
Determine the bond that is more exposed to interest rate risk. (2 marks)

(f) A collateralised mortgage obligation (CMO) security has a floating rate tranche C. Tranche C has been split to create a floater with a principal of Sh.80,416,667 and an inverse floater with a principal of Sh.16,083,333 as shown below:

Tranche		Par Amount (Sh.)	Coupon (%)
A		194,500,000	7.50
B		36,000,000	7.50
C	Floater	80,416,667	
	Inverse floater	16,083,333	
D		73,000,000	7.50

Required:

(i) Determine the capitalisation rate for the inverse floater if the coupon rate for the floater is 1 month LIBOR plus 1%. (3 marks)

(ii) Determine the capitalisation rate on the floater assuming that the coupon formula for the floater is 1 month LIBOR plus 1%, and a floor of zero is imposed on the inverse floater. (3 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,t} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^t}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 30 November 2017. **Time Allowed: 3 hours.**

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Explain four return characteristics that distinguish alternative investments from traditional investments. (4 marks)

(b) (i) Explain four market imperfections that could limit an investor's ability to implement arbitrage transaction in the commodity market. (4 marks)

(ii) Discuss three theories of commodity futures returns. (6 marks)

(c) Theresa Mwende works for a firm that deals with non-conforming residential mortgages. She has assembled Sh.80 million pool of 30 year-fixed rate mortgages with unusually high loan-to-value (LTV) ratios. Theresa Mwende meets with a potential investor who inquires about the pool created from these securities. Mwende explains to the client that the pool has a weighted average coupon (WAC) of 7.10% and a weighted average maturity (WAM) of 356 months and that under current market conditions, prepayments are expected at 310 PSA (Public Securities Association Standard Prepayment Model). Mwende also presents a table showing pool cash flow estimates for a different prepayment assumption. An extract of that table is given below:

Mortgage pool monthly cash flow estimates

Months from now	Mortgage payment	Outstanding balance	Net interest	Scheduled principal
24	Sh.327,321	Sh.47,563,831	Sh.281,419	Sh.45,901

The single monthly mortality (SMM) prepayment rate is assumed to be 2.1482%.

Required:

(i) The conditional prepayment rate (CPR) for the pool. (3 marks)

(ii) The expected prepayment amount for month 24 of the pool's life. (3 marks)

(Total: 20 marks)

QUESTION TWO

(a) (i) Real estate has been a very large and important portion of wealth for thousands of years. However, there are some aspects of real estate that could discourage its inclusion in an investment portfolio.

In relation to the above statement, discuss three potential disadvantages of investing in real estate. (6 marks)

(ii) Highlight three advantages of real estate investment trusts (REITs) ownership compared to direct real estate ownership. (3 marks)

(b) A real estate lender agreed to make a 10% interest-only (IO) loan on a property that was recently appraised at Sh.1,200,000 as long as the debt-to-service coverage ratio (DSCR) is at least 1.5 and the loan-to-value (LTV) ratio does not exceed 80%. The property has a net operating income of Sh.135,000.

Required:

The equity capitalisation rate (Equity dividend rate) given that the property is purchased for the above appraised value. (5 marks)

(c) Upperhill Tower is a 200,000 square foot residential apartment building located in Nairobi, Kenya. The building has an effective age of 10 years, while its total economic life is estimated at 40 years. The building has a structural problem that is not feasible to repair. The building also needs a new roof at a cost of Sh.1 million. The new roof will increase the value of the building by Sh.1,300,000.

The bedrooms in each apartment are too small, thus rents are Sh.400,000 a year lower than the competing properties.

The negative impact on rents is estimated to be Sh.600,000 per year due to traffic congestion, power interruption and inadequate water supply and dumpsite being located nearby.

Due to recent construction of competing properties, vacancy rates have increased significantly resulting in an estimated loss in value of Sh.1,200,000.

The cost to replace Upperhill Tower is estimated at Sh.400 per square foot plus builder's profit of Sh.5,000,000. The market value of the land is estimated at Sh.20,000,000. The appropriate discount rate is 8%.

Required:
Estimate the value of Upperhill Tower using the cost approach.

(6 marks)
(Total: 20 marks)

QUESTION THREE

(a) Summarise three forms of hedge fund regulation. (3 marks)

(b) Assess three benefits of investing in mezzanine debt. (6 marks)

(c) In relation to leveraged buyouts (LBOs), explain the term "cash sweep". (1 mark)

(d) The following information and assumptions relate to a leveraged buyout (LBO) structure:

Assumptions	Year-1 to Year-5
Sales growth	5.0%
Cost of goods sold as a percentage of sales	60.0%
Selling, general and administration expenses as a percentage of sales	15.0%
Depreciation as a percentage of sales	5.5%
Transaction fee amortisation	Sh.1 million each year
Tax rate	30.0%
Capital expenditure as a percentage of sales	5.5%
Increase in working capital as a percentage of increase in sales	7.0%

Uses of funds:	Sh. "million"
Purchase price	200.0
Transaction costs	5.0
Total	205.0
Sources of funds:	
Senior debt at 9.0%	45.0
Junior debt at 13.0%	100.0
Equity	60.0
Total	205.0

	Year 0 Sh. "million"
Net sales	170.0
Cost of goods sold	(102.0)
Selling, general and administration expenses	(25.5)
Depreciation	(9.4)
Operating income	33.1
Transaction fee amortisation	-
Earnings before interest and taxes	33.1

Required:
Determine for the five years, the ending balance for the:

(i) Senior debt. (5 marks)

(ii) Junior debt. (5 marks)
(Total: 20 marks)

QUESTION FOUR
(a) Evaluate three limitations of investing in funds of hedge funds. (6 marks)

(b) The exit value is a critical element in the return for the private equity firm and is considered carefully before the investment is undertaken. The means and timing of the exit strongly influence the exit value.

Required:
Explain three exit routes that private equity firms use. (6 marks)

(c) Protus Murumba, a Chief Investment Officer at an endowment fund is reviewing the following investment data relating to an investment in energy commodities:

Year	GSCI total annul return (%)	GSCI collateral yield (%)	GSCI Roll yield (%)	GSCI Spot annual return (%)
1	29.1	9.6	?	6.1
2	–30.5	?	–14.2	–24.3

Note: GSCI is Goldman Sachs Commodity Index, a composite index of commodity sector returns which represents a broadly diversified, unleveraged long-only position in commodity futures.

Required:
(i) The roll yield for year 1. (2 marks)

(ii) The collateral yield for year 2. (2 marks)

(iii) Murumba notes that the collateral yield is positive in both scenarios although the GSCI total annual return for year 2 is –30.5%. He asks for an explanation with regard to the positive yield.

Justify the positive collateral yield by discussing the concepts of margin and implied yield. (2 marks)

(iv) A consultant tells Murumba "commodities exhibit positive event risk".

Justify the consultant's statement by discussing the relationship between commodity prices and event risk.
(2 marks)
(Total: 20 marks)

QUESTION FIVE
(a) Explain five stages of venture capital fund development. (10 marks)

(b) Alex Kilonzo tells Ann Kipruto that he has seen exciting data on the performance of market-neutral, convertible arbitrage, and global macro hedge funds. Kilonzo states "The Sharpe ratios of all of these hedge fund strategies are much higher than for traditional equities or bonds, which means they have a greater risk-return profile. We should definitely plan a major investment in hedge funds".

Kipruto responds "There are several reasons that the Sharpe ratio may be misleading".

Required:
(i) Advise Ann Kipruto on four situations that could cause an upward bias in the calculation of the hedge fund Sharpe ratio. (4 marks)

(ii) Evaluate two reasons that statistically indicate that the Sharpe ratio is not the most appropriate measure of risk for the hedge funds. (2 marks)

(c) A hedge fund manager purchases 10 convertible bonds with a par value of Sh.1,000, a coupon of 7.5%, and a market price of Sh.900. The conversion ratio for the bonds is 20. The hedge ratio for the bonds is 0.5. The fund manager receives a short rebate of 4.5%. The current price of the underlying ordinary shares is Sh.45 per share. The manager pays for the 10 bonds without using any leverage. Later, the price of the ordinary share increase to Sh.47 per share, and the price of the convertible bond increases to Sh.920.

Required:
Compute the holding period return (HPR) for the convertible bond arbitrage transaction. (4 marks)
(Total: 20 marks)

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CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 25 May 2017.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Explain how the following primary structures distinguish alternative investments from other traditional investments:

     (i)   Regulatory structure.   (1 mark)

     (ii)   Trading structure.   (1 mark)

     (iii)   Compensation structure.   (1 mark)

     (iv)   Securities structure.   (1 mark)

     (v)   Institutional structure.   (1 mark)

(b)   (i)   Analyse two factors which could have contributed to the creation of collateralised debt obligations (CDO's).   (2 marks)

     (ii)   Highlight three economic advantages of using a synthetic collateralised debt obligation (CDO) structure compared to a cash CDO structure.   (3 marks)

(c) Describe two types of private equity real estate investment indices.   (2 marks)

(d) Hedge funds across the globe have come under increasing pressure in regard to their operations including their fee structure.

Required:
Argue three cases against hedge fund fee structure.   (3 marks)

(e) The net operating income (NOI) of a leased property is expected to be Sh.1 million per year over the next four years. At the beginning of year five, the NOI is expected to increase to Sh.1.2 million and to grow at a rate of 3% per annum. The property is sold after four years. The investors require a 13% return.

Required:
The value of the property today.   (5 marks)
            (Total: 20 marks)

QUESTION TWO

(a) Describe the role played by each of the following outside service providers in the creation and operation of alternative investments:

     (i)   Advocates.   (1 mark)

     (ii)   Hedge fund infrastructure.   (1 mark)

     (iii)   Consultants.   (1 mark)

     (iv)   Fund administrators.   (1 mark)

     (v)   Depositories and custodians.   (1 mark)

(b) List three reasons that would motivate a portfolio manager to include hedge funds in a portfolio.   (3 marks)

(c) Explain the effect of decline in interest rates on each of the following types of collateralised mortgage obligations (CMOs):

     (i)   Planned amortisation class (PAC).   (1 mark)

     (ii)   Support bonds.   (1 mark)

(d) The following information relates to a collateralised mortgage obligation (CMO) structure backed by 8% collateral:

Tranche	Par amount (Sh.million)	Coupon rate (%)
A	300	6.50
B	250	6.75
C	200	7.25
D	250	7.75

A client wants a notional interest only (IO) with a coupon of 8%.

Required:
The notional amount for this notional interest only (IO) tranche. (6 marks)

(e) Green Delivery Ltd. (GDL) has defaulted on its senior unsecured debt. Popat Finance Ltd. (PFL) owns Sh.5 million of bond series X as well as Sh.4 million in credit default swap (CDS) protection. Bond X is now trading at 25% of the par value. Snowline Securities Ltd. (SSL) owns Sh.10 million of bond series Y, also senior unsecured debt which is trading at 30% of the par value. SSL has Sh.9 million in CDS protection on bond Y.

Required:
The potential CDS payout amounts to:

(i) Green Delivery Ltd. (2 marks)
(ii) Snowline Securities Ltd. (2 marks)
(Total: 20 marks)

QUESTION THREE

(a) Describe the following types of alternative real estate investment vehicles:

(i) Exchange-traded funds (ETFs). (1 mark)
(ii) Commingled real estate funds (CREFs). (1 mark)
(iii) Syndications. (1 mark)
(iv) Joint ventures. (1 mark)
(v) Open-end real estate mutual fund. (1 mark)

(b) Commodities are often viewed as an asset class that helps investors diversify a portfolio of traditional assets (shares and bonds) due to low return correlation between commodities and traditional assets.

Required:
In relation to the above statement, argue four cases why commodity returns might have low correlation relative to traditional assets. (4 marks)

(c) (i) Outline three benefits of applying price-to-funds from operations (P/FFO) and price-to adjusted funds from operations (P/AFFO) multiple in the valuation of a real estate investment trust (REIT) and a real estate operating company (REOC). (3 marks)

(ii) A financial analyst has gathered the following information relating to a real estate investment trust (REIT):

	Sh.
Non-cash (straight line) rent.	207,430
Depreciation	611,900
Recurring maintenance type capital expenditures and leasing commission	550,750
Adjusted funds from operations (AFFO)	3,320,000
AFFO per share	3.32

Required:
The REIT's fund from operations (FFO) per share. (4 marks)

(d) Suppose that wheat is trading in the spot market at Sh.800 per bushel since bad weather caused a decrease in supply during the previous harvest. Market participants expect a bountiful harvest in about six months which is expected to drive market prices down to Sh.500 per bushel. Forward prices with delivery dates after the next harvest are trading at the range of Sh.500 per bushel.

Required:
Explain how an arbitrageur could attempt to profit from the above prices. (4 marks)
(Total: 20 marks)

QUESTION FOUR

(a)   (i)   Argue three cases for the fast growth and concentration of the hedge fund industry in the recent past.

(6 marks)

(ii)   Evaluate three disadvantages of investing in funds of funds.

(3 marks)

(b)   Identify three possible ways through which a leveraged buyout (LBO) firm could generate its revenue.   (3 marks)

(c)   Burbon Limited, a venture capital firm will require Sh.3 million in the first round of financing and a second round of financing three years later of Sh.2 million to finance the firm's expansion to the size expected at exit. The firm is expected to be worth Sh.40 million after five years. The founders will hold 1 million shares.

The relevant discount rate is 40% for the first three years and 30% for the last two years.

Required:
The price per share of Burbon Ltd. at the time of second round of financing.

(8 marks)
(Total: 20 marks)

QUESTION FIVE

(a)   Examine three reasons that could motivate an entity to enter into a credit default swap agreement.   (3 marks)

(b)   Describe three distressed debt investment strategies.

(3 marks)

(c)   Propose four strategies which could be used by leveraged buyout (LBO) firms to exit investments.   (4 marks)

(d)   A 12-year-old industrial property is being valued using the cost approach. The appraiser feels that it has an effective age of 15 years based on its current condition. For instance, there are cracks in the foundation that are not feasible to repair (incurable physical depreciation). That is, it would cost more to try to repair these problems than the value that would be created in the property. The appraiser believes that the industrial property has 60-year remaining economic life (75-year total economic life).

The building was constructed using a greater ceiling height than users require in the current market (super-adequacy). It would cost Sh.27 million to reproduce (reproduction cost) the building with the same ceiling height but Sh.25 million to construct a replacement property (replacement cost) with the same utility but a normal ceiling height. The higher ceiling results in increased heating and air conditioning costs of Sh.50,000 per annum. A capitalisation rate that would be used to value the property would be 10 per cent.

The building was designed to include a cafeteria that is no longer functional (functional obsolescence). This area can be converted to usable space at a conversion cost of Sh.25,000 and it is believed that the value of the property would increase by at least this amount (curable functional obsolescence).

The roof needs to be replaced at a cost of Sh.250,000 and other necessary repairs amount to Sh.50,000. The costs of these repairs will increase the value of the building by at least Sh.300,000 (curable physical depreciation).

The road providing access to the property is a two-lane road, whereas newer industrial properties are accessible by four-lane roads. This has a negative impact on rents (locational obsolescence), which is estimated to reduce the net operating income (NOI) by Sh.100,000 annually.

Based on comparable sales of vacant land, the land is estimated to be worth Sh.5 million.

Required:
Estimate the value of the land using the cost approach.

(10 marks)
(Total: 20 marks)

....

Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,n} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8939	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0183	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

KASNEB

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 24 November 2016.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE
(a)   Describe the following classes of modern alternative investments:

   (i)   Managed futures.   (1 mark)

   (ii)   Hedge funds.   (1 mark)

   (iii)   Distressed securities.   (1 mark)

(b)   Highlight three errors that an investment analyst could make when valuing real estate investments trusts (REITs) using
        the discounted cash flow method.   (3 marks)

(c)   An arbitrageur trades gold when the spot price is 400 United States Dollars (USD) per ounce (oz) while one-year futures
        contract price is USD 460/oz. An investor can borrow or lend funds at a rate of 10% per annum.

        Assume that the transaction cost is 3%.

        Required:
        The arbitrage profit from this transaction.   (6 marks)

(d)   A single tenant office building was leased six years ago at a price of Sh.2,000,000 per year. The next rent review occurs
        in two years time. The estimated rental value (ERV) in two years based on the current market conditions is
        Sh.3,000,000 per year.
        The all risk yield cap rate for comparable fully - let properties is 7%. Due to lower risk, the appropriate rate to discount
        the term rent is 6%.

        Required:
        The value of the office building.   (5 marks)

(e)   Ten equally weighted representative paths are used in the Monte Carlo simulation model. For the different spreads used,
        the present value of each representative path for a collateralised mortgage obligation (CMO) tranche is as shown below:

	Present value if spread is:		
Representative path	**75 basis points (bps)**	**80 basis points (bps)**	**85 basis points (bps)**
1	72	62	65
2	77	75	72
3	81	79	76
4	84	81	77
5	69	65	63
6	83	81	77
7	91	87	83
8	87	85	81
9	69	66	62
10	93	59	56

The market price of tranche Y is 74.

Required:
The option adjusted spread (OAS) of tranche Y.   (3 marks)
                                                                                                    (Total: 20 marks)

QUESTION TWO

(a) (i) Evaluate three contrasts between "venture capital" and "buyouts" as used in private equity investments. (3 marks)

(ii) Venture capital firms have become increasingly specialised as a result of the intensive knowledge base required to invest in the technology, telecommunications, and biotechnology industries. Specialisation has expanded further to include the stage of investment in the life cycle of a start-up company. Unfortunately, specialisation has led to concentrated portfolios, the very anathema of reduced risk through diversification. This concentration has led to the need for higher risk premiums.

Required:
With reference to the above statement, assess three main risks that could contribute to the higher required risk premiums for venture capital. (3 marks)

(b) Discuss three considerations that should be taken into account when forecasting long-term growth rates for real estate investment trusts (REITs) and real estate operating companies (REOCs) using the discounted cash flow approach.
(3 marks)

(c) Ali Musa is an alternative investments manager at Venus Capital. He is considering analysing a two-tranche (a PAC 1 tranche and a support tranche) from a collateralised mortgage obligation (CMO) that was issued 18 months ago. When the CMO was issued, the initial collar of the PAC 1 tranche was 150-400 PSA. He estimates the change in the average life of each tranche as the prepayment speed varies, assuming the prepayment speed stays at that speed until the tranche matures. The results are as shown below:

Average life of tranches XX and tranche YY for varying prepayment speeds:

	Average Life	
PSA speeds	Tranche XX	Tranche YY
0	21.9	12.2
50	17.5	8.9
100	13.2	5.1
150	9.1	5.1
200	4.3	5.1
250	3.6	5.1
300	2.9	5.1
350	2.0	4.7
400	1.4	3.9

Note:
- PSA is the public securities association, a model for analysing mortgage-backed securities.
- PAC is the planned amortisation class.

Required:
(i) Determine the most likely support tranche. (2 marks)

(ii) Determine the effective collar of PAC 1 tranche. (2 marks)

(d) A real estate investment with an initial cost of Sh.45 million was sold after five years at a price of Sh.75 million. The cost associated with the sale was Sh.5 million, and the tax depreciation in each year was Sh.2 million. At the time of the sale, the outstanding mortgage balance will be Sh.34 million. The tax rate on recaptured depreciation and the long-term capital gain tax rate is 30%.

Required:
The equity reversion after tax for this real estate investment. (3 marks)

(e) Stela Wambua is conducting due diligence on a hedge fund for a pension fund. She gathers the following information relating to the structure of the fund:

1. The fund employs three people – two principals; Samuel Mulati and John Omulundo, and an administrative assistant. Samuel Mulati's prior work experience is 10 years as an equity analyst at Jeremy Investment Bank and prior to that as an associate at a law firm. He holds Bachelor of Business Administration (BBA) and Bachelor of Laws (LLB) degrees.
2. John Omulundo worked for three years as an equity fund manager at a medium size mutual fund. Prior to that, he was a corporate finance associate at a start up investment bank.

3.	The principals are employed on contract basis.
4.	The fund's relationship with its prime broker extends back two years. The fund has used only one prime broker since it was formed. The prime broker is a prestigious firm ranked number two by rating agencies in the brokerage business.

Hedge fund strategy:
*	The fund invests in both fixed income and equities markets.
*	The fund buys 10-year Treasury note and borrows short-term loans abroad in markets that have particularly low interest rates to earn, currently, a positive spread.
*	The fund conducts merger arbitrage involving the securities of the target and acquirer.

Legal strategy:
The fund has a 1 and 20 fee structure and a two-year lock-up period.

Required:
Based on the above information, analyse four risk factors associated with this hedge fund investment.　(4 marks)

(Total: 20 marks)

QUESTION THREE

(a)	(i)	Research and Development (R & D) and patents provide an important insight into intellectual property (IP) in the context of the establishment and preservation of property rights. Unlike tangible assets, for which property rights are typically indicated by possession and usually clearly established, IP often raises challenges regarding its potential non-excludability.

Required:
In the context of the above statement, summarise five risks associated with investment in patents as a category of intellectual property investment.　(5 marks)

(ii)	Institutional investors have recently expressed an increased interest in the returns produced by direct ownership of real assets, and in particular farmland assets.

Required:
In relation to the above statement, discuss three factors that have motivated institutional investors to venture into farmland investment.　(6 marks)

(b)	Highlight two assumptions of models used in the valuation of mortgage-backed securities.　(2 marks)

(c)	Describe two conditions necessary to value a security using Monte Carlo simulation model.　(2 marks)

(d)	A venture capital fund manager is considering investing Sh.25 million in a new project that he believes would pay Sh.120 million at the end of five years. The cost of equity for the investor is 15%. The estimated probability of failure is presented below:

Year	1	2	3	4	5
Probability of failure	0.20	0.20	0.17	0.15	0.15

Note: The above probabilities are conditional probabilities since they represent the probability of failure in year N, given that the firm has survived to year N.

Required:
(i)	The net present value (NPV) of the potential investment.　(4 marks)

(ii)	Comment on the decision you would make based on the results obtained in (d)(i) above.　(1 mark)

(Total: 20 marks)

QUESTION FOUR
(a)	With respect to commodities markets, describe the following indices:

(i)	Value-based index.　(1 mark)

(ii)	Quantity-based index.　(1 mark)

(iii)	Total return index.　(1 mark)

(iv)	Excess return index.　(1 mark)

(b) (i) Discuss three functions of a private equity fund manager. (3 marks)

(ii) Describe three differences between private equity fund and quoted equity fund. (3 marks)

(c) Furaha Property Investment Limited is intending to purchase a complex of 20 specialty retail shops. At this time, 18 units are occupied under graduated leases with five years currently remaining, and two units are vacant. Each of the units measures approximately 2,000 square feet. Under the existing leases, current rents (for year 2016) are in line with market rates at Sh.12 per square foot a year, and all lease agreements are reviewed at the beginning of each year. An analyst, Fatuma Juma who works for Furaha Property Investment Limited has assembled the following facts to assist her in valuation of the property which is offered at Sh.4,500,000:

1. Under the graduated lease provision, rents will increase at a rate of 5% per year in line with expectations for the commercial rental market.
2. Vacancy rates of 10% are considered typical in this sector.
3. The current tax rate is Sh.18.50 per Sh.1,000 of assessed valuation. The property is assessed for tax purposes at Sh.4 million. Neither the tax rate nor assessed value is expected to change in the next one year.
4. The landlord is responsible for all real estate taxes, exterior maintenance, comprehensive insurance, management expenses and repairs or replacements.
5. The following cost elements are expected to increase at a rate of 3% per year for the foreseeable future:

2016 Cost Elements
- Maintenance: General maintenance costs are Sh.500 per month.
- Insurance: Annual premium for comprehensive insurance is Sh.10,000.
- Management: Annual management expenses are Sh.25,000.
- Repairs: Allowance for repairs and replacement is Sh.15,000 per year.

6. Recent sales price and projected net income for properties comparable to Furaha Property Investment Limited are shown below:

	Property A	Property B	Property C
Price (Sh.)	3,525,000	4,875,000	2,350,000
Net operating income (Sh.)	246,750	438,750	188,000

7. Fatuma Juma intends to consider an alternative capitalisation rate using a band of investment technique. If the investment is made, Furaha Property Investment Limited will pay 20% in cash and finance the remainder over a period of 30 years. Given the prevailing terms of 7% a year on a 30-year mortgage with monthly payments, the mortgage constant will be 0.0719.

8. Fatuma Juma believes that the equity capitalisation rate is 10%.

Required:

(i) Furaha Property Investment Limited's net operating income (NOI) for year 2017. (5 marks)

(ii) The investment value of the property using the direct capitalisation approach. (3 marks)

(iii) The overall capitalisation rate using the band of investment technique. (2 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Evaluate two managed futures trading strategies. (4 marks)

(b) Discuss how each of the following factors would most likely affect the prepayment risk of the mortgage-backed pass through securities:

(i) Coupon rate of the mortgage. (2 marks)

(ii) Age of the mortgage. (2 marks)

(iii) Seasonality. (2 marks)

(c) A passive manager purchases a position worth Sh.50 million in underlying value of a commodities futures contract. The manager also buys Sh.50 million worth of 10-year Treasury bonds that pay an interest rate of 5% per annum. After the end of one month, the commodities futures contract position has appreciated by 2% and the price of the 10-year Treasury bond is unchanged.

Required:
The gain in the value of the position. (2 marks)

(d) An investor owns two 30-year original maturity mortgage-backed securities (MBS), MBS-A and MBS-B. He uses the 10-year Treasury yield as a relative measure to gauge the level of current 30-year home mortgage rates. Over the past four years, the 10-year Treasury yield has declined below 5.50% three times, subsequently rising above 6.50% each time. The 10-year Treasury yield is currently at 6.50%.

The following information relates to the two mortgage-backed securities:

Issue	Coupon (%)	Weighted average maturity (months)	Price (Sh.)	Current month PSA	CPR
MBS-A	7.50	355	100	500	5
MBS-B	7.50	260	100	200	12

Note:
- PSA is the prepayment scale developed by Public Securities Association (PSA) for analysing mortgage-backed securities.

- CPR is the conditional prepayment rate, a loan prepayment rate equal to the proportion of the principal of a pool of loans assumed to be paid off prematurity in each period.

Required:
(i) Explain the difference in the prepayment sensitivity of the two securities assuming a future decline in the 10-year Treasury yield of slightly more than 100 basis points. (4 marks)

(ii) Determine, with reasons, the security that would realise a higher percentage of principal prepayment, based on the current month PSA and CPR prepayment data. (2 marks)

(iii) Describe two reasons why prepayments are likely to be more stable for automobile receivable asset-backed securities when compared to similar duration mortgage-backed securities. (2 marks)

(Total: 20 marks)

....

Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	9709	.9615	.9524	.9434	.9346	9259	.9174	.9091	.8929	8772	.8696	8621	.8475	.8333	.8065	7813	.7576	7353
2	.9803	.9612	.9426	.9246	.9070	.8900	8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	5739	5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	6575	.6407	.6086	.5787	.5245	.4768	4348	3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	6806	.6499	.6209	.5674	5194	.4972	.4761	.4371	.4019	.3411	2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	4556	.4323	.4104	.3704	.3349	.2751	.2274	1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	8963	.8043	.7224	.6496	.5847	.5268	.4751	4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	1597	1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	3152	.2745	.2394	.1827	1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	0099
16	8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	1229	1069	.0930	.0708	.0541	.0320	.0193	.0118	0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	1486	1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	0378	.0304	.0245	0160	.0105	.0046	.0021	0010	0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	0070	.0042	.0016	0006	0002	.0001
40	.6717	4529	.3066	.2083	.1420	.0972	.0668	0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,t} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1- \frac{1}{(1+r)^n}}{r}$$

Number of Payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

KASNEB

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 26 May 2016.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE
(a) Hedge funds were highly proficient at attracting capital prior to the world financial crises that began in 2007. However, in the recent past, hedge funds have increasingly competed with private equity firms in the purchase of corporate assets in the search for attractive opportunities in which to invest capital.

Required:
With respect to the above statement, evaluate five major differences between typical hedge fund incentive fees and typical private equity fund incentive fees.   (5 marks)

(b) Mezzanine debt can be viewed as filling either a gap in a company's financial structure or a gap in the supply of capital in the financial markets. This makes mezzanine financing extremely flexible.

Required:
In the context of the above statement, explain five characteristics of mezzanine debt that help to distinguish it from the other sources of financing and other types of investments.   (5 marks)

(c) An investment management firm is considering the following three investments in real estate:

1.   Direct investment in an existing office building.
2.   Investment in a public equity real estate investment trust (REIT).
3.   Equity investment in a public real estate operating company (REOC).

The data relating to the investment is presented below:

Option 1: Direct investment in an office building

Expected net operating income: Years 1-7	Sh.7.0 million
Expected net operating income: Year 8	Sh.8.5 million
Required return on equity investment	10%.
Net operating income growth rate after 8 years	3.25%.

Option 2: Real estate investment trust (REIT)

Recent net operating income	Sh.140 million
Non cash rents	Sh.5 million
Full year adjustments for acquisition	Sh.5 million
Other assets	Sh.50 million
Total liabilities	Sh.300 million
Current market price per share	Sh.125
Shares outstanding	15 million
Going in cap rate	7.00%
Net operating income growth rate	2.50%

Option 3: Real estate operating company (REOC)

Expected adjusted funds from operations (AFFO) in year 8	Sh.13.5 million
Holding period	7 years
Present value of all dividends for 7 years	Sh.39.7 million
Shares outstanding	1.0 million
Cap rate	7.0%
Growth rate from year 8	2.50%

Additional information:
1. The office building under consideration has existing tenants with long term leases that will expire in seven years.
2. The real estate operating company (REOC) terminal value at the end of seven years is to be based on a price to adjusted funds from operations (AFFO) multiple of 12 times (12x).

Required:
(i) The estimated value of the office building using the discounted cash flow approach. (4 marks)

(ii) Determine whether the real estate investment trust (REIT) is fairly priced using the net asset value (NAV) approach. (3 marks)

(iii) Calculate the estimated value per share of the real estate operating company (REOC). (3 marks)
(Total: 20 marks)

QUESTION TWO
(a) Discuss the following equity hedge fund strategies:

(i) Market neutral strategy. (1 mark)

(ii) Sector specific strategy. (1 mark)

(iii) Fundamental growth strategy. (1 mark)

(iv) Quantitative directional strategy. (1 mark)

(v) Short bias strategy. (1 mark)

(b) Representativeness is the key aspect of hedge fund databases and indices. The representativeness of a sample is the extent to which the characteristics of that sample are similar to the characteristics of the universe. If the sample consistently favours inclusion of observations based on a particular characteristic, then the sample is biased in favour of that characteristic.

Required:
Based on the aforementioned statement, assess the following data biases associated with hedge fund databases.

(i) Survivorship bias. (1 mark)

(ii) Selection bias. (1 mark)

(iii) Instant history bias/backfill bias. (1 mark)

(iv) Liquidation bias. (1 mark)

(c) Ukulima University endowment fund makes an investment in a venture capital fund known as Beta Fund with a vintage year of 2013 and committed capital of Sh.195 million. The distribution waterfalls calls for a 20% carried interest when the net asset value (NAV) before distributions exceeds the committed capital.

The performance of Sh.195 million of the venture Beta Fund capital is shown below:

Year	Called down Sh. "million"	Management fees Sh. "million"	Operating results Sh. "million"
2013	30	0.45	-10
2014	25	0.83	55
2015	75	1.95	75

Required:
(i) Calculate the year 2015 percentage management fee of the Beta Fund. (3 marks)

(ii) Determine the net asset value (NAV) of the fund after distributions for the year 2015. (4 marks)

(d) Stephen Ayabi, a private equity fund analyst is evaluating fund A and fund B whose information is provided below:

	Fund A	Fund B
Gross internal rate of return (IRR)	22.1%	2.4%
Net internal rate of return (IRR)	17.6%	-0.3%
Performance quantile	1	3
Distributed to paid in capital (DPI)	1.43	0.29
Residual value to paid in capital (RVPI)	1.52	1.03
Total value to paid in capital (TVPI)	2.95	1.32
Maturity of fund	6 years	4 years

Required:
Compare the financial performance of private equity fund A and fund B. (4 marks)

(Total: 20 marks)

QUESTION THREE

(a) Explain three ways of categorising infrastructure investment as an alternative asset. (3 marks)

(b) Commodities are often viewed as an asset class that is distinct from shares and bonds (financial assets) in several regards.

Required:
In relation to the above statement, discuss three reasons that might make commodity prices not to have high positive correlation with share prices and bond prices. (3 marks)

(c) Highlight two disadvantages of investing in each of the following private real estate investment vehicles:

(i) Private equity real estate funds. (2 marks)

(ii) Commingled real estate funds (CREFs). (2 marks)

(d) Oduor Okoth is considering an investment in a two-sequential pay tranche collateralised mortgage obligation (CMO) and would like to understand how the cash flows are paid. Principal payments are made first to the highest seniority tranche, Tranche A, and next to the lower seniority tranche, Tranche B.

The CMO structure is as follows:

Tranche	Outstanding par value Sh. "million"	Coupon rate %
A	200	7
B	100	7

The total principal prepayments, both scheduled and unscheduled, are Sh.456,350 in month 1.

Required:
Calculate the cash flow allocation in Month 1. (6 marks)

(e) (i) A speculator trades crude oil when the spot price is 40 United States dollars (USD) while the expiring futures contract is priced at 42 USD. Sometime later, a new futures contract is priced at 45 USD while crude oil is currently priced at 42.80 USD.

Required:
The roll yield. (2 marks)

(ii) An asset is priced at Sh.90. A futures contract on the asset expires in 75 days. The risk free interest rate is 7%. The underlying asset's storage cost at the futures expiration is equal to Sh.3.00 and the compound value at the time of the futures expiration of the positive cash flows from the underlying asset is Sh.0.50.

Required:
The appropriate futures price. (2 marks)

(Total: 20 marks)

QUESTION FOUR

(a) (i)   Analyse three risk factors associated with real estate investment.   (3 marks)

(ii) Evaluate three disadvantages of investing in real estate through publicly traded securities.   (3 marks)

(b) Jabavu Investments Services (JIS) operates as a hedge fund with an initial capital of Sh.350 billion. JIS charges a 3.2 per cent management fee based on assets under management at the end of the year. JIS also charges a 32 per cent incentive fee based on returns which are beyond a 10.2 per cent hurdle rate. In its first year, JIS hedge fund appreciates by 17.2 per cent. JIS calculates its management fees using end-of-period valuation.

Required:
The investors net return.
(Assume that the performance fee is calculated net of management fee).   (4 marks)

(c) The table below shows monthly returns for a hedge fund and an index portfolio. The hurdle rate is the 91-day Treasury Bill rate, assumed to be 10% per annum.

Month	January	February	March	April	May	June	July	August	September	October	November	December
Hedge fund return (%)	7.1	8.1	-1.1	-4.1	-2.1	1.9	-2.1	3.5	5.5	7.5	0.9	-6.5
Index return (%)	-1.9	-8.1	-3.3	6.1	-8.5	4.1	5.1	-4.3	-4.1	1.1	6.2	0.5

The calculated annualised standard deviations for the hedge fund and the index are 16.84% and 17.87% respectively.

Required:
(i)   The annualised downside deviations for the hedge fund and the index.   (3 marks)

(ii) Contrast the results obtained in (c)(i) above with the calculated annualised standard deviations above.   (1 mark)

(iii) The Sortino ratio for the hedge fund and the index.   (5 marks)

(iv) Comment on the performance of the hedge fund against the performance of the index portfolio based on the result obtained in (c)(iii) above.   (1 mark)
                                                                                  (Total: 20 marks)

QUESTION FIVE

(a) (i)   Explain the term separately managed accounts (SMAs) in relation to alternative investments.   (1 mark)

(ii) Evaluate four ways in which separately managed accounts differ from a fund.   (4 marks)

(b) Describe four categories of outside service providers as major participants in the world of alternative investments.
                                                                                             (4 marks)

(c) An asset backed security (ABS) structure has the following data:

Senior tranche   Sh.150 million.
Subordinated tranche A   Sh.60 million.
Subordinated tranche B   Sh.20 million.
The assets in the pool are worth Sh.250 million

Required:
Determine the amount of losses at which the senior tranche investors would begin to lose money.   (3 marks)

(d) The following data relates to selected mortgage backed securities (MBSs):

MBS	Initial principal Sh. "millions"	Coupon rate (%)	Underlying maturity (years)	Nominal spread (%)	Option adjusted spread (%)	Z-spread (%)
W	250	7.0	30	1.21	0.28	0.79
X	175	7.8	25	1.43	0.49	1.16
Y	225	7.2	20	1.62	0.31	1.12
Z	190	8.0	30	1.59	0.40	1.14

The outstanding principal of MBS-Z is Sh.183 million at the beginning of month 20 and the total mortgage principal payment for the month is Sh.0.42 million.

Required:

(i)   Calculate the expected prepayment for month 20 using 125 public securities association (PSA).   (2 marks)

(ii)   Justify the MBS that would add the most relative value in relation to the risk associated with the security, assuming the effective durations of the MBS securities is approximately the same.   (2 marks)

(e)   A cash funded collateralised debt obligation (CDO) has a reference pool of assets that consists of 50 loans. The notional amount of each loan is Sh.5 million. The mezzanine tranche for this CDO has a notional value of Sh.20 million, and the spread is 90 basis points. The loss given default is 60%. The mezzanine tranche has a lower attachment point of 2% and a tranche width of 3%.

Required:

The loss for the mezzanine tranche if six defaults occur.   (4 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	7576	7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	7695	7561	7432	.7182	.6944	.6504	.6104	5739	5407
3	.9706	.9423	.9151	.8890	.8638	.8396	8163	.7938	.7722	.7513	.7118	6750	.6575	.6407	.6086	.5787	.5245	.4768	4348	3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	7084	.6830	6355	5921	5718	.5523	.5158	.4823	.4230	.3725	3294	2923
5	9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	5194	4972	.4761	.4371	.4019	.3411	2910	2495	.2149
6	9420	.8880	.8375	.7903	.7462	.7050	.6663	6302	.5963	.5645	.5066	.4556	.4323	.4104	3704	.3349	.2751	.2274	1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	0462
11	8963	.8043	7224	.6496	.5847	.5268	.4751	.4289	3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	1685	1372	.1122	.0757	.0517	0357	.0250
13	.8787	7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	1625	.1452	.1163	.0935	.0610	.0404	.0271	0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	3152	.2745	.2394	.1827	1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	1069	.0930	.0708	.0541	.0320	.0193	.0118	0073
17	8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	1078	0929	.0802	.0600	.0451	.0258	.0150	.0089	0054
18	8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	0808	.0691	.0508	.0376	.0208	.0118	.0068	0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	2317	1945	.1635	.1161	0829	0703	.0596	.0431	.0313	.0168	.0092	.0051	0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	2145	1784	1486	1037	0728	.0611	.0514	.0365	0261	.0135	.0072	.0039	.0021
25	7798	.6095	.4776	.3751	.2953	.2330	.1842	1460	.1160	.0923	.0588	0378	0304	0245	0160	0105	.0046	.0021	.0010	0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	0196	0151	.0116	0070	.0042	.0016	.0006	.0002	0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	0460	.0318	.0221	.0107	0053	0037	.0026	0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	0134	.0085	.0035	0014	0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	0057	.0033	.0011	.0004	.0002	.0001						

The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,n} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \dfrac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.3045	7.1327	6.6605	6.2463	5.5541	4.9995	4.1666	3.5714	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

KASNEB

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

THURSDAY: 26 November 2015.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a)   Highlight six types of risks associated with infrastructure as a form of alternative investment.   (6 marks)

(b)   Describe three investment characteristics of stripped mortgage-backed securities.   (3 marks)

(c)   The ultimate goal for private equity investment is to improve new or under-performing businesses and exit them at high valuations. However, the time to exit can range from less than six months to over 10 years.

Required:
In relation to the above statement, examine three exit strategies pursued by private equity portfolio managers. (3 marks)

(d)   Kipkorir Kipyegon is an alternative investment manager for Stanbib Asset Managers (SAM) which deals with commodities trading. He is currently investigating trading opportunities in the copper market. The spot price is Sh.316 and the three-month forward contract price is Sh.313. He is contemplating implementing a reverse cash and carry arbitrage to profit from the difference between the spot and forward prices.

Currently, Kipyegon can borrow or lend cash at the rate of 5% and the lease rate for copper is 6%. The borrowing, lending and lease rates are all continuously compounded interest rates.

Required:
(i)   Describe the two components of the synthetic commodity position in this arbitrage.   (2 marks)

(ii)   Compute Kipyegon's profit on a reverse cash and carry arbitrage in the copper market.   (6 marks)
(Total: 20 marks)

QUESTION TWO

(a)   Explain the following economic terms as used in private equity fund structures:

(i)   Carried interest.   (1 mark)

(ii)   Ratchet.   (1 mark)

(iii) Hurdle rate.   (1 mark)

(iv)   Management fees.   (1 mark)

(v)   Vintage year.   (1 mark)

(b)   Assess five ways which drives expansion of real estate investment trusts (REITs).   (5 marks)

(c)   An investor purchases a 30-year, Sh.500,000 level payment fully amortised mortgage with a fixed rate of 12%.

Required:
The outstanding principal at the end of three months.   (3 marks)

(d)   The original founder members of Madonge Ltd. are extremely optimistic and believe that the firm could be sold for Sh.400 million in six years. To achieve this target, they speculate that the firm will require another capital infusion of Sh.40 million in four years time in addition to the Sh.20 million capital investment today.
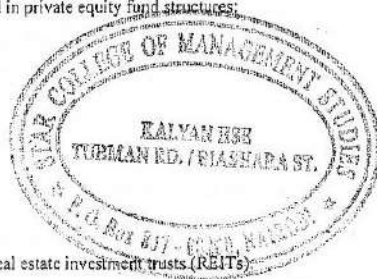
Given the high risk of the firm, Madonge Ltd.'s private equity investors decide that a discount rate of 40% for the first four years and 30% for the last two years would be appropriate. The founders of Madonge Ltd. intend to hold five million shares.

Required:
(i) The firm's post money valuation at the first round of financing using the net present value (NPV) venture capital method.   (4 marks)

(ii) The appropriate share price after the first round of financing for Madonge Ltd.'s first round investors.   (3 marks)
                                                                                          (Total: 20 marks)

QUESTION THREE
(a) Kiraita Kindika is the chief investment officer of a pension fund which allocates a substantial portion of its assets to private equity. The existing private equity portfolio is made up of large buyout funds, mezzanine funds and a limited allocation to a special situations fund. The pension fund decided to further increase its allocation to a venture capital.

Required:
In relation to the above statement, summarise four differences between venture capital and buyout investing. (4 marks)

(b) (i) Summarise four classifications of hedge funds.   (4 marks)

(ii) Explain three regulatory concerns associated with hedge funds.   (3 marks)

(c) An investment analyst gathered the following data relating to three collateralised mortgage obligation (CMO) tranches:

	Nominal spread (%)	Spread comparison Zero volatility spread (%)	Option adjusted spread (%)
Security X	2.12	1.67	0.00
Security Y	3.18	1.30	-0.27
Security Z	1.84	1.46	0.67

Required:
Determine the most appropriate security for the investment analyst to invest in.   (3 marks)

(d) A collateralised debt obligation (CDO) is a Sh.200 million structure. The collateral is expected to have an initial value of Sh.200 million. The collateral also consists entirely of bonds with 15 years to maturity and a coupon rate equal to 15-year treasury bond rate plus 350 basis points.
The senior tranche represents 75% of the structure and carries a floating coupon rate equal to LIBOR plus 150 basis points. There is only one Sh.20 million mezzanine tranche which carries a fixed coupon equal to the treasury rate at origination plus 175 basis points. The manager of the Trust has entered into an interest rate swap under which the Trust will pay an annual fixed rate equal to the treasury rate plus 125 basis points and receive LIBOR. The notional amount for this swap is Sh.150 million. The 15-year treasury rate is 7.5% at the time of origination for this CDO.

Required:
Calculate the cash flow available to pay the tranche.   (6 marks)
                                                                                          (Total: 20 marks)

QUESTION FOUR
(a) Evaluate four ways in which investors could participate in commodity markets.   (4 marks)

(b) Discuss four challenges that could be encountered by investment professionals when analysing private equity investments.   (4 marks)

(c) A critical investment feature that distinguishes commercial mortgage-backed securities (CMBS) from residential mortgage-backed securities (RMBS) is the protection against early prepayments available to investors called "call protection". An investor in RMBS is exposed to considerable prepayment risk since the borrower has the right to repay a loan, in whole or in part, before the scheduled principal repayment date.

Required:
With reference to the above statement, explain four mechanisms that offer investors call protection at the loan level.
                                                                                          (4 marks)

(d) The general partner for a private equity fund charges a management fee of 2% and carried interest of 20% using the total return method. The total committed capital for the fund is Sh.150 million.

The following data relates to the above equity fund:

Year	Capital called down Sh. "million"	Cash flows Operating results Sh. "million"	Distributions Sh. "million"
2010	50	-10	-
2011	20	-25	-
2012	30	25	-
2013	20	50	20
2014	10	60	40
2015	10	110	80

Required:
Residual value to paid in (RVPI). (8 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Evaluate three key benefits of using price-to-funds from operations (P/FFO) and price-to-adjusted funds from operations (P/AFFO) multiples in the valuation of real estate investment trusts (REITs) and real estate operating companies (REOCs). (3 marks)

(b) Discuss three sources of return for a commodity futures position. (3 marks)

(c) Distinguish between the following terms:

(i) "Contango" and "backwardation". (2 marks)

(ii) "Market-defensive funds of funds" and "strategic funds of funds". (2 marks)

(d) Brian Nyanam has recently completed a monte carlo simulation analysis of a collateralised mortgage obligation (CMO) tranche. His analysis includes six equally weighted paths, with the present value of each calculated using four different discount rates.

The table below illustrates this information:

Representative path	At 50 basis points spread	Present values: At 60 basis points spread	At 70 basis points spread
1	70	68	68
2	73	70	68
3	68	66	64
4	71	69	68
5	77	75	73
6	75	73	71

The actual market price of the CMO tranche being valued is 70.17.

Required:
Determine the tranche's option adjusted spread (OAS). (3 marks)

(e) (i) Define the term "rolling return of a hedge fund". (1 mark)

(ii) The following information relates to a hedge fund's returns and the respective index returns for twelve months:

Month	Hedge fund returns (%)	Index returns (%)
January	3.50	-2.40
February	4.00	-4.00
March	-2.00	-1.60
April	-2.00	3.00
May	-1.00	-4.20
June	0.90	2.00
July	-1.00	2.50
August	1.70	-2.10
September	2.70	-2.00
October	3.70	0.50
November	0.40	3.10
December	-3.20	0.20

Required:
The average rolling return for the hedge fund if the investor's investment horizon is nine months.   (6 marks)

(Total: 20 marks)

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Present Value of 1 Received at the End of n Periods:

$$PVIF_{r,n} = 1/(1+r)^n = (1+r)^{-n}$$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%	36%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.8929	.8772	.8696	.8621	.8475	.8333	.8065	.7813	.7576	.7353
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.7972	.7695	.7561	.7432	.7182	.6944	.6504	.6104	.5739	.5407
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7118	.6750	.6575	.6407	.6086	.5787	.5245	.4768	.4348	.3975
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6355	.5921	.5718	.5523	.5158	.4823	.4230	.3725	.3294	.2923
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5674	.5194	.4972	.4761	.4371	.4019	.3411	.2910	.2495	.2149
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5066	.4556	.4323	.4104	.3704	.3349	.2751	.2274	.1890	.1580
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4523	.3996	.3759	.3538	.3139	.2791	.2218	.1776	.1432	.1162
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4039	.3506	.3269	.3050	.2660	.2326	.1789	.1388	.1085	.0854
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3606	.3075	.2843	.2630	.2255	.1938	.1443	.1084	.0822	.0628
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3220	.2697	.2472	.2267	.1911	.1615	.1164	.0847	.0623	.0462
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.2875	.2366	.2149	.1954	.1619	.1346	.0938	.0662	.0472	.0340
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2567	.2076	.1869	.1685	.1372	.1122	.0757	.0517	.0357	.0250
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2292	.1821	.1625	.1452	.1163	.0935	.0610	.0404	.0271	.0184
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2046	.1597	.1413	.1252	.0985	.0779	.0492	.0316	.0205	.0135
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.1827	.1401	.1229	.1079	.0835	.0649	.0397	.0247	.0155	.0099
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1631	.1229	.1069	.0930	.0708	.0541	.0320	.0193	.0118	.0073
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1456	.1078	.0929	.0802	.0600	.0451	.0258	.0150	.0089	.0054
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1300	.0946	.0808	.0691	.0508	.0376	.0208	.0118	.0068	.0039
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1161	.0829	.0703	.0596	.0431	.0313	.0168	.0092	.0051	.0029
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1037	.0728	.0611	.0514	.0365	.0261	.0135	.0072	.0039	.0021
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0588	.0378	.0304	.0245	.0160	.0105	.0046	.0021	.0010	.0005
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0334	.0196	.0151	.0116	.0070	.0042	.0016	.0006	.0002	.0001
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0107	.0053	.0037	.0026	.0013	.0007	.0002	.0001		
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0035	.0014	.0009	.0006	.0003	.0001				
60	.5504	.3048	.1697	.0951	.0535	.0303	.0173	.0099	.0057	.0033	.0011	.0004	.0002	.0001						

* The factor is zero to four decimal places

Present Value of an Annuity of 1 Per Period for n Periods:

$$PVIF_{r,t} = \sum_{t=1}^{n} \frac{1}{(1+r)^t} = \frac{1 - \frac{1}{(1+r)^n}}{r}$$

Number of payments	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%	16%	18%	20%	24%	28%	32%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.8929	0.8772	0.8696	0.8621	0.8475	0.8333	0.8065	0.7813	0.7576
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.6901	1.6467	1.6257	1.6052	1.5656	1.5278	1.4568	1.3916	1.3315
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4018	2.3216	2.2832	2.2459	2.1743	2.1065	1.9813	1.8684	1.7663
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.0373	2.9137	2.8550	2.7982	2.6901	2.5887	2.4043	2.2410	2.0957
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6048	3.4331	3.3522	3.2743	3.1272	2.9906	2.7454	2.5320	2.3452
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.1114	3.8887	3.7845	3.6847	3.4976	3.3255	3.0205	2.7594	2.5342
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3893	5.2064	5.0330	4.8684	4.5638	4.2883	4.1604	4.0386	3.8115	3.6046	3.2423	2.9370	2.6775
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	4.9676	4.6389	4.4873	4.3436	4.0776	3.8372	3.4212	3.0758	2.7860
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.3282	4.9464	4.7716	4.6065	4.3030	4.0310	3.5655	3.1842	2.8681
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.6502	5.2161	5.0188	4.8332	4.4941	4.1925	3.6819	3.2689	2.9304
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	5.9377	5.4527	5.2337	5.0286	4.6560	4.3271	3.7757	3.3351	2.9776
12	11.2551	10.5753	9.9540	9.3851	8.8633	8.3838	7.9427	7.5361	7.1607	6.8137	6.1944	5.6603	5.4206	5.1971	4.7932	4.4392	3.8514	3.3868	3.0133
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034	6.4235	5.8424	5.5831	5.3423	4.9095	4.5327	3.9124	3.4272	3.0404
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.6282	6.0021	5.7245	5.4675	5.0081	4.6106	3.9616	3.4587	3.0609
15	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061	6.8109	6.1422	5.8474	5.5755	5.0916	4.6755	4.0013	3.4834	3.0764
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237	6.9740	6.2651	5.9542	5.6685	5.1624	4.7296	4.0333	3.5026	3.0882
17	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216	7.1196	6.3729	6.0472	5.7487	5.2223	4.7746	4.0591	3.5177	3.0971
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014	7.2497	6.4674	6.1280	5.8178	5.2732	4.8122	4.0799	3.5294	3.1039
19	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649	7.3658	6.5504	6.1982	5.8775	5.3162	4.8435	4.0967	3.5386	3.1090
20	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136	7.4694	6.6231	6.2593	5.9288	5.3527	4.8696	4.1103	3.5458	3.1129
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770	7.8431	6.8729	6.4641	6.0971	5.4669	4.9476	4.1474	3.5640	3.1220
30	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	12.4090	11.2578	10.2737	9.4269	8.0552	7.0027	6.5660	6.1772	5.5168	4.9789	4.1601	3.5693	3.1242
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5693	3.1242
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148	8.2438	7.1050	6.6418	6.2335	5.5482	4.9966	4.1659	3.5712	3.1250
60	44.9550	34.7609	27.6756	22.6235	18.9293	16.1614	14.0392	12.3766	11.0480	9.9672	8.3240	7.1401	6.6651	6.2402	5.5553	4.9999	4.1667	3.5714	3.1250

KASNEB

CIFA PART III SECTION 5

ALTERNATIVE INVESTMENTS ANALYSIS

PILOT PAPER

September 2015.   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

QUESTION ONE

(a)   Consider the following asset backed security (ABS) structure:

Tranche	Sh.
Senior tranche	200,000,000
Subordinate tranche A	150,000,000
Subordinate tranche B	70,000,000
Total	420,000,000

If the assets in the pool are worth Sh.450,000,000, what is the amount of collateralisation and at what amount of losses will the senior tranche investors begin to lose money?   (2 marks)

(b)   In the context of mortgage backed securities (MBS), explain five factors that affect prepayments and the types of prepayment risks.   (10 marks)

(c)   An appraiser has been asked to estimate the value of a warehouse. He has collected the following information:

		Comparable Transactions		
Unit of comparison	Subject property	1	2	3
Size in square feet	30,000	40,000	20,000	35,000
Age in years	5	9	4	5
Physical condition	Average	Good	Average	Poor
Location	Prime	Prime	Secondary	Prime
Sale date months ago		6	18	12
Sale price		9,000,000	4,500,000	8,000,000

Each adjustment is based on the unadjusted sales price of the comparable. Properties depreciate at 2% per annum.

Additional information:
1.   Since comparable No.1 is four years older than the subject, an upward adjustment of Sh.720,000 is made [Sh.9,000,000 x 2% x 4 years].
2.   Condition adjustment: Good: +5%, average: none; poor:-5%. Because comparable No.1 is in better condition than the subject, a downward adjustment of Sh.450,000 is made [Sh.9,000,000 x 5%]. Similarly, an upward adjustment of Sh.450,000 is made [Sh.9,000,000 x 5%]. Similarly, an upward adjustment is made for comparable No.3 to the tune of Sh.400,000 [Sh.8,000,000 x 5%].
3.   Location adjustment: Prime - none, Secondary - 10%. Because both comparable No.1 and the subject are in a prime location, no adjustment is made.
4.   Over the past 24 months, sales prices have been appreciating at 0.5% per month. Because comparable No.1 was sold six months ago, an upward adjustment of Sh.270,000 is made [Sh.9,000,000 x 0.5% x 6 months].

Compute the value of the subject property using the sales comparison approach.   (8 marks)
                                                                                                  (Total: 20 marks)

QUESTION TWO

(a) Explain four alternative exit strategies in private equity and their impact on value. (8 marks)

(b) Two private equity funds, fund X and fund Y, are being considered by an investor. Financial performance of private equity fund X and fund Y is shown below:

	Fund X	Fund Y
Gross IRR	22.1%	2.4%
Net IRR	17.6%	-0.3%
Performance quartile	1	3
DPI (Distributed to paid-in capital)	1.43	0.29
RVPI (Residual value to paid-in capital)	1.52	1.03
TVPI (Total value to paid-in capital)	2.95	1.32
Maturity of fund	6 years	4 years

Required:

(i) Interpret and compare the financial performance of private equity funds X and Y. (5 marks)

(ii) Describe motivations for hedge fund replication strategies. (6 marks)

(iii) Distinguish between alternative investments and traditional investments. (1 mark)

(Total: 20 marks)

QUESTION THREE

(a) Jenga Ltd.'s bonds have a duration of 5.6 years and a convexity of 38.2. Tengeneza Ltd.'s bonds have a duration of 7.3 years and a convexity of 38.2.

Required:
Determine which bond is exposed to more interest rate risk when the interest rate increases by 100 basis points. (2 marks)

(b) A company is valued at Sh.10,000,000 prior to a capital infusion of Sh.4,000,000 by a venture capital investor.

Required:
The post-money valuation and the venture capital investor's proportional ownership. (4 marks)

(c) Kumiko fund is a hedge fund with a value of Sh.100 million at the beginning of the year (an all-time high). Kumiko funds charges 2% management fee based on assets under management at the beginning of the year and a 20% incentive fee with a 5% hard hurdle rate and uses a high water mark. Incentive fees are calculated on gains net of management fees. The ending values before fees are:

Year 1: Sh.125.75 million.
Year 2: Sh.127.40 million.
Year 3: Sh.138.44 million.

Required:
The total fees and investor's net return for all three years. (14 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Describe the three broad strategies applicable to hedge funds. (15 marks)

(b) Explain the following terms as used in commodities:

(i) Contango. (1 mark)

(ii) Back Wardation. (1 mark)

(iii) Collateral yield. (1 mark)

(iv) Price return. (1 mark)

(v) Roll yield. (1 mark)

(Total: 20 marks)

QUESTION FIVE

(a) James Adanje, a quantitative analyst dealing with commodities investments for Alpha investment recently returned from a seminar. In that seminar, Jack Baker, a well publicised quantitative analyst at national brokerage firm, discussed one of his new models in great detail, and Adanje was intrigued by the new concepts. He proceeds to test this model making some minor changes but retaining the overall concept, until he produces some very positive results. Adanje quickly announces to his supervisors at Alpha Investment that he has discovered a new model and that clients and prospective clients alike should be informed of this positive finding as ongoing proof of Alpha's continuing innovation and ability to add value.

Required:
Explain whether Adanje has violated any ethical principles applicable in the investment and financial analysis profession. (5 marks)

(b) Assume the current spot price is Sh.1500 per bag of wheat and the effective monthly interest rate is 1%. The monthly storage costs for wheat is Sh.40 per bag.

Calculate the 3-month forward price for a bag of wheat. (7 marks)

(c) A real estate lender agreed to make a 10% interest-only loan on a property that had just been appraised for Sh.1,200,000 as long as the debt service coverage ratio is at least 1.5 and the loan-to-value ratio does not exceed 80%.

Required:
The maximum loan amount assuming the property's net operating income (NOI) is Sh.135,000. (5 marks)

(d) Distinguish between traditional investing and hedge fund investing. (3 marks)
(Total: 20 marks)

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THURSDAY: 28 May 2015.   ASSET MANAGEMENT   CSIA PART III SECTION 5   Time Allowed: 3 hours.

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Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a)   In relation to mortgage backed securities:

    (i)   Differentiate between "contraction risk" and "extension risk".   (2 marks)

    (ii)   Discuss three factors that could affect prepayment behaviour.   (3 marks)

(b)   Summarise three advantages of empirical duration approach in financial analysis.   (3 marks)

(c)   Naomi Mburu is the investment advisor for a large company's defined benefit pension plan. The current asset allocation of the plan is 65% domestic equities and 35% domestic fixed income. The plan uses an asset only investment approach and is overseen by a risk-averse board. The numerical risk aversion level for the board is estimated to be equal to 6 on a scale of 1 to 8, where 8 represents the highest degree of risk aversion.

Naomi Mburu advises the board on diversification benefits and provides the expected returns and standard deviations of two global portfolios as presented below:

Portfolio risk-return profiles

Portfolio	Expected return	Standard deviation
A	6.5%	10.0%
B	7.5%	13.5%

Some members of the board believe that portfolio selection should focus on maximising expected utility but others hold an opinion that shortfall risk is more important.

The board uses Roy's safety-first criterion as a measure of shortfall risk and has specified a minimum return threshold of 5%. The risk-free rate is assumed to be 2%.

Required:

    (i)   The portfolio that the board should select based on expected utility approach.   (3 marks)

    (ii)   The portfolio that the board should select based on Roy's safety-first criterion.   (3 marks)

(d)   Discuss three challenges faced by investors in measuring the risk-adjusted performance of a private equity fund.   (6 marks)

(Total: 20 marks)

QUESTION TWO

(a)   Discuss five types of credit enhancements available for commercial mortgage-backed securities.   (10 marks)

(b)   Silver Bank has a title to a five bedroomed house situated on a one acre piece of land in an up-market estate in your country. The bank acquired the property at an auction for the loan balance owed by a previous owner. The bank has indicated that the asking price for the property is Sh.150 million. AM Ltd. is considering the purchase of this property. An estimate of the costs associated with the acquisition and expenses of owning the property for one year is as follows:

                    Sh."million"

Acquisition fees	3
Renovation costs	18
Selling costs	5

AM Ltd. acquires the property through a loan of Sh.150 million and wants to achieve a 20% return (annual rate, compounded monthly) on its investments during this one year period.

Required:
The selling price for the property by AM Ltd.   (5 marks)

(c)   A real estate investment has the following pattern of expected returns:

Year	Cash flows (Sh."000")
1	5,000
2	10,000
3	12,000
4	15,000
4 (sale of property)	120,000

The investment requires an initial outlay of Sh.106,750,000.

The internal rate of return on equity investment is partitioned based on cash flow from operations and cash flow from sales.

The cost of capital is 12%.

Required:
The proportion of the internal rate of return that is represented by the cash flow from operations and cash flow from sale of property.   (5 marks)

(Total: 20 marks)

QUESTION THREE

(a)   Argue three cases against the use of net asset value (NAV) approach to value private equity funds.   (6 marks)

(b)   Fiduciary Investment Fund (FIF) is a private equity fund that is six years old. The fund is ongoing. Investors invested Sh.100 million and received a distribution of funds of Sh.75 million at the end of year 5 and a Sh.50 million distribution at the end of year 6. The net asset value (NAV) of the firm at the end of year 6 is estimated to be Sh.250 million. As the investment analyst at FIF, you are expected to present the performance of the equity fund using different performance measures to the investors.

Required:
Using the information provided above, calculate the following equity fund performance measures interpreting each of the calculated performance measure to the investors:

    (i)   Total value paid in (TVPI) ratio.   (3 marks)

    (ii)   Distribution to paid in (DPI) ratio.   (3 marks)

    (iii)   Residual value to paid in (RVPI) ratio.   (3 marks)

(c)   Michael Papis is the chief investment officer of his country's retirement fund. The fund has always used outside advisers for the real estate allocation, and this information is clearly presented in all fund communications.

Thomas Ngale, a recognised sell-side research analyst and Michael Papis's business school classmate, recently left the investment bank he worked for to start his own asset management firm; Accessible Asset Managers (AAM).

Thomas Ngale is trying to build his assets under management and contacts Michael Papis about gaining some of the retirement fund's allocation. In the previous few years, the performance of the retirement fund's real estate investments was in line with the fund's benchmark but was not extraordinary. Michael Papis decides to help out his old friend and also to seek better returns by moving the real estate allocation to AAM.

The only notice of the change in adviser appears in the next annual report in the listing of associated advisers.

Required:
Based on the information provided above, comment on whether Michael Papis violated any standard of professional conduct as an investment professional.   (5 marks)

(Total: 20 marks)

QUESTION FOUR

(a)   Explain the following methods of call protection for the commercial mortgage-backed securities (CMBS) at the loan-level:

    (i)   Prepayment lock out.   (2 marks)

    (ii)   Defeasance.   (2 marks)

    (iii)   Prepayment penalty points.   (2 marks)

    (iv)   Yield maintenance charges.   (2 marks)

(b)   Francis Onyango is reviewing various mortgage-backed securities (MBS) and is interested in the calculation of single monthly mortality (SMM) rates. He intends to use the Public Securities Association (PSA) standard prepayment benchmark.

4

QUESTION THREE

(a) Jenga Ltd.'s bonds have a duration of 5.6 years and a convexity of 38.2. Tengeneza Ltd.'s bonds have a duration of 7.3 years and a convexity of 38.2.

Required:
Determine which bond is exposed to more interest rate risk when the interest rate increases by 100 basis points.
(2 marks)

(b) A company is valued at Sh.10,000,000 prior to a capital infusion of Sh.4,000,000 by a venture capital investor.

Required:
The post-money valuation and the venture capital investor's proportional ownership. (4 marks)

(c) Kumiko fund is a hedge fund with a value of Sh.100 million at the beginning of the year (an all-time high). Kumiko funds charges 2% management fee based on assets under management at the beginning of the year and a 20% incentive fee with a 5% hard hurdle rate and uses a high water mark. Incentive fees are calculated on gains net of management fees. The ending values before fees are:

Year 1: Sh.125.75 million.
Year 2: Sh.127.40 million.
Year 3: Sh.138.44 million.

Required:
The total fees and investor's net return for all three years.
(14 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Describe the three broad strategies applicable to hedge funds. (15 marks)

(b) Explain the following terms as used in commodities:

(i) Contango. (1 mark)

(ii) Back Wardation. (1 mark)

(iii) Collateral yield. (1 mark)

(iv) Price return. (1 mark)

(v) Roll yield. (1 mark)
(Total: 20 marks)

QUESTION FIVE

(a) James Adanje, a quantitative analyst dealing with commodities investments for Alpha investment recently returned from a seminar. In that seminar, Jack Baker, a well publicised quantitative analyst at national brokerage firm, discussed one of his new models in great detail, and Adanje was intrigued by the new concepts. He proceeds to test this model making some minor changes but retaining the overall concept, until he produces some very positive results. Adanje quickly announces to his supervisors at Alpha Investment that he has discovered a new model and that clients and prospective clients alike should be informed of this positive finding as ongoing proof of Alpha's continuing innovation and ability to add value.

Required:
Explain whether Adanje has violated any ethical principles applicable in the investment and financial analysis profession. (5 marks)

(b) Assume the current spot price is Sh.1500 per bag of wheat and the effective monthly interest rate is 1%. The monthly storage costs for wheat is Sh.40 per bag.

Calculate the 3-month forward price for a bag of wheat. (7 marks)

(c) A real estate lender agreed to make a 10% interest-only loan on a property that had just been appraised for Sh.1,200,000 as long as the debt service coverage ratio is at least 1.5 and the loan-to-value ratio does not exceed 80%.

Required:
The maximum loan amount assuming the property's net operating income (NOI) is Sh.135,000. (5 marks)

(d) Distinguish between traditional investing and hedge fund investing. (3 marks)
(Total: 20 marks)

3

THURSDAY: 26 November 2015. 0728776317   Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Highlight six types of risks associated with infrastructure as a form of alternative investment. (6 marks)

(b) Describe three investment characteristics of stripped mortgage-backed securities. (3 marks)

(c) The ultimate goal for private equity investment is to improve new or under-performing businesses and exit them at high valuations. However, the time to exit can range from less than six months to over 10 years.

Required:
In relation to the above statement, examine three exit strategies pursued by private equity portfolio managers. (3 marks)

(d) Kipkorir Kipyegon is an alternative investment manager for Stanbib Asset Managers (SAM) which deals with commodities trading. He is currently investigating trading opportunities in the copper market. The spot price is Sh.316 and the three-month forward contract price is Sh.313. He is contemplating implementing a reverse cash and carry arbitrage to profit from the difference between the spot and forward prices.

Currently, Kipyegon can borrow or lend cash at the rate of 5% and the lease rate for copper is 6%. The borrowing, lending and lease rates are all continuously compounded interest rates.

Required:
(i) Describe the two components of the synthetic commodity position in this arbitrage. (2 marks)

(ii) Compute Kipyegon's profit on a reverse cash and carry arbitrage in the copper market. (6 marks)
(Total: 20 marks)

QUESTION TWO

(a) Explain the following economic terms as used in private equity fund structures:

(i) Carried interest. (1 mark)

(ii) Ratchet. (1 mark)

(iii) Hurdle rate. (1 mark)

(iv) Management fees. (1 mark)

(v) Vintage year. (1 mark)

(b) Assess five ways which drives expansion of real estate investment trusts (REITs). (5 marks)

(c) An investor purchases a 30-year, Sh.500,000 level payment fully amortised mortgage with a fixed rate of 12%.

Required:
The outstanding principal at the end of three months. (3 marks)

(d) The original founder members of Madonge Ltd. are extremely optimistic and believe that the firm could be sold for Sh.400 million in six years. To achieve this target, they speculate that the firm will require another capital infusion of Sh.40 million in four years time in addition to the Sh.20 million capital investment today.

Given the high risk of the firm, Madonge Ltd.'s private equity investors decide that a discount rate of 40% for the first four years and 30% for the last two years would be appropriate. The founders of Madonge Ltd. intend to hold five million shares.

Required:
(i) The firm's post money valuation at the first round of financing using the net present value (NPV) venture capital method. (4 marks)

(ii) The appropriate share price after the first round of financing for Madonge Ltd.'s first round investors. (3 marks)
(Total: 20 marks)

QUESTION THREE

(a) Kiraita Kindika is the chief investment officer of a pension fund which allocates a substantial portion of its assets to private equity. The existing private equity portfolio is made up of large buyout funds, mezzanine funds and a limited allocation to a special situations fund. The pension fund decided to further increase its allocation to a venture capital.

Required:
In relation to the above statement, summarise four differences between venture capital and buyout investing. (4 marks)

(b) (i) Summarise four classifications of hedge funds. (4 marks)

(ii) Explain three regulatory concerns associated with hedge funds. (3 marks)

(c) An investment analyst gathered the following data relating to three collateralised mortgage obligation (CMO) tranches:

	Nominal spread (%)	Spread comparison Zero volatility spread (%)	Option adjusted spread (%)
Security X	2.12	1.67	0.00
Security Y	3.18	1.30	-0.27
Security Z	1.84	1.46	0.67

Required:
Determine the most appropriate security for the investment analyst to invest in. (3 marks)

(d) A collateralised debt obligation (CDO) is a Sh.200 million structure. The collateral is expected to have an initial value of Sh.200 million. The collateral also consists entirely of bonds with 15 years to maturity and a coupon rate equal to 15-year treasury bond rate plus 350 basis points.
The senior tranche represents 75% of the structure and carries a floating coupon rate equal to LIBOR plus 150 basis points. There is only one Sh.20 million mezzanine tranche which carries a fixed coupon equal to the treasury rate at origination plus 175 basis points. The manager of the Trust has entered into an interest rate swap under which the Trust will pay an annual fixed rate equal to the treasury rate plus 125 basis points and receive LIBOR. The notional amount for this swap is Sh.150 million. The 15-year treasury rate is 7.5% at the time of origination for this CDO.

Required:
Calculate the cash flow available to pay the tranche. (6 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Evaluate four ways in which investors could participate in commodity markets. (4 marks)

(b) Discuss four challenges that could be encountered by investment professionals when analysing private equity investments. (4 marks)

(c) A critical investment feature that distinguishes commercial mortgage-backed securities (CMBS) from residential mortgage-backed securities (RMBS) is the protection against early prepayments available to investors called "call protection". An investor in RMBS is exposed to considerable prepayment risk since the borrower has the right to repay a loan, in whole or in part, before the scheduled principal repayment date.

Required:
With reference to the above statement, explain four mechanisms that offer investors call protection at the loan level. (4 marks)

(d) The general partner for a private equity fund charges a management fee of 2% and carried interest of 20% using the total return method. The total committed capital for the fund is Sh.150 million.

The following data relates to the above equity fund:

Year	Capital called down Sh. "million"	Cash flows Operating results Sh. "million"	Distributions Sh. "million"
2010	50	-10	
2011	20	-25	
2012	30	25	
2013	20	50	20
2014	10	60	40
2015	10	110	80

Required:
Residual value to paid in (RVPI). (8 marks)
(Total: 20 marks)

QUESTION FIVE

(a) Evaluate three key benefits of using price-to-funds from operations (P/FFO) and price-to-adjusted funds from operations (P/AFFO) multiples in the valuation of real estate investment trusts (REITs) and real estate operating companies (REOCs). (3 marks)

(b) Discuss three sources of return for a commodity futures position. (3 marks)

(c) Distinguish between the following terms:

(i) "Contango" and "backwardation". (2 marks)

(ii) "Market-defensive funds of funds" and "strategic funds of funds". (2 marks)

(d) Brian Nyanam has recently completed a monte carlo simulation analysis of a collateralised mortgage obligation (CMO) tranche. His analysis includes six equally weighted paths, with the present value of each calculated using four different discount rates.

The table below illustrates this information:

Representative path	At 50 basis points spread	Present values: At 60 basis points spread	At 70 basis points spread
1	70	68	68
2	73	70	68
3	68	66	64
4	71	69	68
5	77	75	73
6	75	73	71

The actual market price of the CMO tranche being valued is 70.17.

Required:
Determine the tranche's option adjusted spread (OAS). (3 marks)

(e) (i) Define the term "rolling return of a hedge fund". (1 mark)

(ii) The following information relates to a hedge fund's returns and the respective index returns for twelve months:

Month	Hedge fund returns (%)	Index returns (%)
January	3.50	-2.40
February	4.00	-4.00
March	-2.00	-1.60
April	-2.00	3.00
May	-1.00	-4.20
June	0.90	2.00
July	-1.00	2.50
August	1.70	-2.10
September	2.70	-2.00
October	3.70	0.50
November	0.40	3.10
December	-3.20	0.20

Required:
The average rolling return for the hedge fund if the investor's investment horizon is nine months. (6 marks)
(Total: 20 marks)

ALTERNATIVE INVESTMENTS ANALYSIS

PILOT PAPER

September 2015.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

QUESTION ONE

(a) Consider the following asset backed security (ABS) structure:

Tranche	Sh.
Senior tranche	200,000,000
Subordinate tranche A	150,000,000
Subordinate tranche B	70,000,000
Total	420,000,000

If the assets in the pool are worth Sh.450,000,000, what is the amount of collateralisation and at what amount of losses will the senior tranche investors begin to lose money? (2 marks)

(b) In the context of mortgage backed securities (MBS), explain five factors that affect prepayments and the types of prepayment risks. (10 marks)

(c) An appraiser has been asked to estimate the value of a warehouse. He has collected the following information:

Unit of comparison	Subject property	Comparable Transactions		
		1	2	3
Size in square feet	30,000	40,000	20,000	35,000
Age in years	5	9	4	5
Physical condition	Average	Good	Average	Poor
Location	Prime	Prime	Secondary	Prime
Sale date months ago		6	18	12
Sale price		9,000,000	4,500,000	8,000,000

Each adjustment is based on the unadjusted sales price of the comparable. Properties depreciate at 2% per annum.

Additional information:
1. Since comparable No.1 is four years older than the subject, an upward adjustment of Sh.720,000 is made [Sh.9,000,000 x 2% x 4 years].
2. Condition adjustment: Good: +5%, average: none; poor:-5%. Because comparable No. 1 is in better condition than the subject, a downward adjustment of Sh.450,000 is made [Sh.9,000,000 x 5%]. Similarly, an upward adjustment of Sh.450,000 is made [Sh.9,000,000 x 5%]. Similarly, an upward adjustment is made for comparable No.3 to the tune of Sh.400,000 [Sh.8,000,000 x 5%].
3. Location adjustment: Prime - none, Secondary - 10%. Because both comparable No.1 and the subject are in a prime location, no adjustment is made.
4. Over the past 24 months, sales prices have been appreciating at 0.5% per month. Because comparable No.1 was sold six months ago, an upward adjustment of Sh.270,000 is made [Sh.9,000,000 x 0.5% x 6 months].

Compute the value of the subject property using the sales comparison approach. (8 marks)
(Total: 20 marks)

QUESTION TWO
(a) Explain four alternative exit strategies in private equity and their impact on value. (8 marks)

(b) Two private equity funds, fund X and fund Y, are being considered by an investor. Financial performance of private equity fund X and fund Y is shown below:

	Fund X	Fund Y
Gross IRR	22.1%	2.4%
Net IRR	17.6%	-0.3%
Performance quartile	1	3
DPI (Distributed to paid-in capital)	1.43	0.29
RVPI (Residual value to paid-in capital)	1.52	1.03
TVPI (Total value to paid-in capital)	2.95	1.32
Maturity of fund	6 years	4 years

Required:
(i) Interpret and compare the financial performance of private equity funds X and Y. (5 marks)

(ii) Describe motivations for hedge fund replication strategies. (6 marks)

(iii) Distinguish between alternative investments and traditional investments. (1 mark)
(Total: 20 marks)

Required:

(i) The single monthly mortality (SMM) for month 22, assuming a 140 Public Securities Association (PSA) standard prepayment benchmark. (4 marks)

(ii) The single monthly mortality (SMM) for month 200 assuming a 90 Public Securities Association (PSA) standard prepayment benchmark. (3 marks)

(c) The following table shows collateralised mortgage obligation (CMO) tranches:

Tranche	Option adjusted spread (OAS) in basis points	Z-spread in basis points	Effective duration
1	65	82	3.60
2	61	81	4.90
3	63	126	9.25

Required:

(i) The option cost of tranche 1, tranche 2 and tranche 3. (3 marks)

(ii) Justifying your answer, identify the relatively most expensive tranche. (2 marks)
(Total: 20 marks)

QUESTION FIVE

(a) Discuss five investment risks that might affect an investor in the real estate sector. (5 marks)

(b) Describe five steps that an investor should follow when selecting a private equity fund manager. (5 marks)

(c) Hydrosoft Limited wishes to acquire a Sh.1,000,000 machine which has a useful life of 8 years. At the end of this time, its residual value is expected to be Sh.150,000. The asset falls into the 5-year property class for depreciation purposes. The company can use either lease or debt financing. Lease payments of Sh.160,000 at the beginning of each of the eight years would be required.

If debt financing is considered, the interest rate would be 10% per annum and the debt payments would be due at the beginning of each of the 8 years.

The company falls under the 30% bracket of corporate tax.

Required:
Advise the management of Hydrosoft Limited on the best financing option. (10 marks)
(Total: 20 marks)

ASSET MANAGEMENT

CSIA PART III SECTION 5

THURSDAY: 4 December 2014.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Adrosoft Limited is a company listed on the Asdaq Securities Exchange. The company intends to set up an employee share ownership plan (ESOP) to enable its employees own part of its ordinary shares.

Required:
Highlight five particulars that Adrosoft Limited should include in its ESOP trust deed before presenting it to the regulatory authority for approval. (5 marks)

(b) Describe three basic properties that a valid benchmark should possess in order to function effectively during fund performance evaluation. (6 marks)

(c) Evaluate two factors that have contributed to the increase in the number of sovereign wealth funds in the global asset management industry. (4 marks)

(d) An asset manager is assessing the value of a property which is financed by 55%, 18-year first mortgage, and 45% equity. The interest rate on the mortgage is 9% payable monthly. The required return on equity is 12%.

Required:
The market capitalisation rate. (5 marks)
(Total: 20 marks)

QUESTION TWO

(a) Describe the following types of mortgages in relation to real asset financing:

(i) Option adjustable-rate mortgage loan. (2 marks)

(ii) Subprime mortgage. (2 marks)

(b) You have been employed as a Securities and Investment Analyst by Afromax Asset Managers (AAM). Agnes Onyango, a client of AAM, intends to rebalance her portfolio so as to include real estate investment trusts (REITs) in the portfolio. She approaches you for professional advice.

Required:
Explain to Agnes Onyango the distinct characteristics of the following types of REITs:

(i) Dedicated REIT. (2 marks)

(ii) Umbrella partnership REIT (UPREIT). (2 marks)

(c) The following information relates to Uchumi real estate investment trust (REIT):

Current price per share	Sh.50
Number of outstanding shares	1,500,000
	Sh. "000"
Net income	3,375
Depreciation	3,000
Property sale profits	2,500
Recurring capital expenditure (cap re)	1,575

Required:

(i) Funds from operations (FFO). (2 marks)

(ii) Adjusted funds from operations (AFFO). (2 marks)

(iii) Adjusted funds from operations (AFFO) yield. (2 marks)

(d) An asset manager uses Monte Carlo simulation model with five representative paths to value tranche M in a collateralised mortgage obligation (CMO) deal. The present value for each representative path is based on discounting the cash flows on an interest rate path plus a spread. For the different spreads used, the present value of each representative path is shown below:

Representative Path	Present value (Sh. Million) if the spread used is:			
	60 basis points	65 basis points	70 basis points	75 basis points
1	68	70	72	77
2	70	68	80	72
3	85	75	75	65
4	88	80	83	86
5	90	85	70	81

Required:
Option adjusted spread (OAS) given that the market price for tranche M is Sh.76 million. (6 marks)
(Total: 20 marks)

QUESTION THREE

(a) (i) Asset managers view pension plans as an important class of institutional investors.

As an asset manager, explain three differences between a "defined contribution pension plan" and a "defined benefit pension plan" to your client. (6 marks)

(ii) Distinguish between an "endowment fund" and a "foundation" as used in management of institutional investor portfolios. (4 marks)

(b) The construction of Savanna Mall has recently been completed. The mall contains 80 store units. Each of these units has an yearly lease payment of Sh.70,000. Based on comparable properties, a vacancy loss rate of 8% is expected over the life of the lease. Operating expenses are 20% of effective gross income.

Required:

(i) Savanna Mall's net operating income (NOI) for year 1. (4 marks)

(ii) An appropriate discount rate for Savanna Mall assuming a liquidity premium of 2%, risk premium of 5%, and a risk free rate of 3%. (2 marks)

(iii) The value of Savanna Mall using the income approach. Assume a net operating income (NOI) growth rate of 3% for year 2 and net selling proceeds of Sh.40 million in year 2. (4 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Evaluate five benefits that might accrue to an investor who holds a pool of funds that are managed by a professional fund manager. (10 marks)

(b) Discuss two requirements that must be met by an asset manager when presenting asset performance reports to both current and potential clients. (4 marks)

(c) The following information relates to a collateralised mortgage obligation (CMO) structure backed by a 10% collateral:

Tranche	Par value (Sh. "000")	Coupon rate (%)
M	400,000	9.00
N	300,000	8.50
O	400,000	8.00
P	300,000	8.25
Q	500,000	7.50

The manager of this collateralised mortgage obligation (CMO) wants to create a notional interest-only tranche with a coupon rate of 10%.

Required:
The notional amount for this interest-only tranche. (6 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Highlight five circumstances under which a member of a professional investment institute such as the Institute of Certified Investment and Financial Analysts (ICIFA) could be guilty of professional misconduct. (5 marks)

(b) John Omurundo is an asset manager of a private equity fund whose performance data is provided below:

	Amount in million shillings
Cummulative paid in	10
Cummulative distributions	12
Net asset value	5

Required:
Compute the following common private equity fund performance measures:

(i) Residual value to paid in (RVPI). (2 marks)

(ii) Distributed to paid in (DPI). (2 marks)

(iii) Total value to paid in (TVPI). (2 marks)

(c) An asset manager gathers the following information relating to an asset-backed security (ABS) for month 30:

Subordinate interest	25%.
Shifting interest percentage	85%.
Regular scheduled principal payment	Sh.3,000,000.
Prepayment	Sh.1,200,000.

Required:

(i) Senior prepayment percentage for the month. (3 marks)

(ii) The amount of the regular scheduled principal payment distributed to the senior class. (3 marks)

(iii) The amount of prepayment distributed to the subordinate class. (3 marks)

(Total: 20 marks)
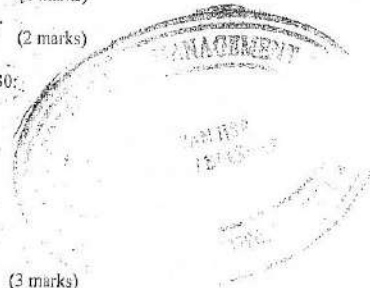
THURSDAY: 29 May 2014.

0728 776 317

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Analyse five principal risks that might affect investment in the real estate sector. (5 marks)

(b) Examine the following spread measures as used in valuation of asset-backed and mortgage-backed securities:

(i) Nominal spread. (1 mark)

(ii) Zero-volatility spread. (1 mark)

(iii) Option adjusted spread (OAS). (1 mark)

(c) John Matiangi, a Certified Securities and Investment Analyst (CSIA) working as a portfolio manager at Mbora Investment Bank is intending to diversify the portfolio he manages through an investment in an office building real estate investment trust (REIT).

Information regarding the selected REIT is as follows:

	Sh. "million"
Estimated 12 months cash net operating income (NOI)	80
Actual funds from operations (FFO) for the year 2013	70
Cash and cash equivalents	65
Accounts receivable	25
Debt and other liabilities	400
Non-cash rents	5
Recurring maintenance - type capital expenditures	13
Expected annual dividend to be paid in the year 2014	5.0

Additional information:

1. The shares outstanding totalled 10 million shares.
2. The dividend growth rate in the years 2015 and 2016 is expected to be 2% per annum and from 2017 into perpetuity to be 1% per annum.
3. The assumed cap rate is 8%.
4. The office subsector average price-to-funds from operations (P/FFO) ratio is 10 times while that of price-to-average funds from operations (P/AFFO) is 14 times.
5. John Matiangi's applicable cost of equity capital is 9% while the risk fee rate is 2%.

Required:

(i) The value of the REIT share using the net asset value (NAV) approach. (3 marks)

(ii) The value of the REIT share using the price-to-funds from operations (P/FFO) ratio approach. (3 marks)

(iii) The value of the REIT share using the price-to-average funds from operations (P/AFFO) ratio approach. (3 marks)

(iv) The value of the REIT share using the discounted cash flow approach. (3 marks)
(Total: 20 marks)

QUESTION TWO

(a) Discuss three factors that investors should consider when selecting and evaluating fund managers. (6 marks)

(b) Analyse three broad categories of hedge fund risks. (6 marks)

(c) The following information relates to a mortgage pool of Maendeleo Trust:

Mortgage Loan	Outstanding mortgage loan balance (Sh. "000")	Mortgage rate (%)	Months remaining to maturity
1	860,000	7.0	200
2	740,000	8.0	190
3	500,000	9.0	180
4	400,000	9.5	185
5	1,000,000	8.5	205
Total	3,500,000		

Required:

(i) The weighted average coupon (WAC) rate for the Maendeleo Trust mortgage pool. (4 marks)

(ii) The weighted average maturity (WAM) for the Maendeleo Trust mortgage pool. (4 marks)
(Total: 20 marks)

QUESTION THREE

(a) Summarise four advantages of investing in real estate through publicly traded securities compared to direct investment in physical real estate. (4 marks)

(b) A defined contribution pension scheme was set up 12 months ago. As the scheme's investment analyst, you are in charge of preparation and presentation of members annual benefit statements. You have been invited at the pension scheme's annual general meeting to give a presentation on the analysis of the members annual benefit statements.

Required:

(i) Explain four reasons why pension schemes issue annual benefits statements to their members. (4 marks)

(ii) Highlight four contents of the annual benefit statements for members of a defined contribution pension scheme. (4 marks)

(c) The following information relates to international portfolios investment performance measurement:

Performance and attribution data.
Annualised returns for five years ended 31 December, 2013.

International Manager/Index	Total return (%)	Country/Security Selection %	Currency return (%)
Manager X	-6.0	2.0	-8.0
Manager Y	-2.0	-1.0	-1.0
EAFE Index	-5.0	0.2	-5.2

Additional information:

1. It is assumed that the data in the above table for manager X and manager Y accurately reflect their investment skills.
2. Both manager X and manager Y actively manage currency exposure.
3. EAFE is an index oftenly used as a benchmark for performance when evaluating investor's international investments.

Required:

(i) Briefly discuss one strength and one weakness of manager X and manager Y. (4 marks)

(ii) Recommend and justify a strategy for each manager that would enable the fund to take advantage of the strength of the two managers, while minimising their weaknesses. (4 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Explain five factors that could influence the investment strategy of a collective investment vehicle. (5 marks)

(b) Ann Shakombo has a retirement savings policy of Sh.15 million which matures shortly on her 60th birthday at which time she will have to choose one of the following three options:

Option 1: To be paid a lump sum of Sh.15 million.
Option 2: To be earning an annual fixed single life income of Sh.1 million (level pension).
Option 3: To be earning an annual fixed single life income of Sh.700,000 set to be increasing annually in line with prices (index-linked pension).

Required:

As an investment analyst specialising in pensions, advise Ann Shakombo on five issues that she should consider before making her decision. (5 marks)

(c) A collateralised debt obligation (CDO) has a Sh.200 million structure, with the collateral having an initial value of Sh.200 million. The collateral consists entirely of bonds with 15 years to maturity and a coupon rate equal to the 15-year treasury rate plus 350 basis points.

The senior tranche represents Sh.150 million (75% of the structure) and carries a floating-coupon rate equal to 182-day treasury bill rate plus 150 basis points. There is one Sh.20 million mezzanine tranche, and it carries a fixed coupon equal to the 15-year treasury rate at origination plus 175 basis points.

The manager of the trust has entered into an interest rate swap under which the trust will pay an annual fixed coupon equal to the 15-year treasury rate plus 125 basis points and receive 182-day treasury bill rate.

The notional amount for this swap is Sh.150 million.

The 15-year treasury rate is 7.5% at the time of origination for this collateralised debt obligation (CDO).

The 182-day treasury bill rate is estimated at 6.75%.

Required:

(i) Interest received by the collateralised debt obligation (CDO) from the collateral and swap counter party. (5 marks)

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(ii) The total interest paid by the collateralised debt obligation (CDO) to the senior tranche, mezzanine tranche and the swap counter party. (3 marks)

(iii) The net cash flow to the equity tranche. (2 marks)

(Total: 20 marks)

QUESTION FIVE

(a) In the recent past, credit card receivable-backed securities have gained popularity among banks, retailers, travel and entertainment companies and other credit card issuers.

Required:
Briefly discuss the following amortisation payment structures with reference to credit card receivable-backed securities:

(i) Passthrough structure. (2 marks)

(ii) Controlled-amortisation structure. (2 marks)

(iii) Bullet-payment structure. (2 marks)

(b) Examine four factors that might contribute to ethical lapses in the financial services industry. (4 marks)

(c) Triplet Towers is a 200,000 square foot high rise apartment building located at South D estate in Akuja town.

The building has an effective age of 10 years. Its economic life is estimated at 40 years. It is believed that the building has a structural problem that is not feasible to repair. The building also needs a new roof at a cost of Sh.1,000,000. If constructed, the new roof is expected to increase the value of the building by Sh.1,300,000. The sitting rooms in each apartment are too small. As a result of this poor planning, rents are Sh.400,000 per annum, which is relatively lower than the competing properties.

Initially, Triplet Towers was located near a beautiful municipal recreational park, but six years ago, the Akuja municipality converted the municipal park to a sewerage treatment plant. This has brought a negative impact on rents estimated at Sh.600,000 per year.

Due to recent construction of competing properties, vacancy rates have increased significantly resulting into a loss of an estimated value of Sh.1,200,000.

The cost to replace Triplet Towers is estimated at Sh.400 per square foot plus builder profit of Sh.5,000,000.

The market value of the land is estimated at Sh.20,000,000.

An appropriate cap rate is 8%.

Required:
The value of Triplet Towers using the cost approach. (10 marks)

(Total: 20 marks)

ASSET MANAGEMENT

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) The Institute of Certified Securities and Investment Analysts (ICSIA) is a professional association of investment analysts. Upon the completion of the Certified Securities and Investment Analysts (CSIA) examination, the CSIA graduate becomes eligible for membership of ICSIA.

Required:
In relation to the above statement, describe three functions of the Institute of Certified Securities and Investment Analysts (ICSIA). (6 marks)

(b) (i) Explain the constant amortisation mortgage (CAM) procedure. (3 marks)

(ii) Evaluate one merit and one demerit of using constant amortisation mortgage (CAM) procedure when analysing mortgage repayment. (4 marks)

(iii) Anthony Muchangi, an investor in the real estate sector acquired a USD 60,000 mortgage from Rwambiti Holding Finance Ltd. repayable within 30 years to finance construction of a commercial building. The mortgage attracts a 12% interest per annum and the payments consisting of both interest and amortisation are to be made monthly.

Required:
A constant payment mortgage (CPM) schedule for the first six months. (7 marks)

(Total: 20 marks)

QUESTION TWO

(a) The investment industry in your country has been under increasing criticism. This is due to the investors being disadvantaged by the conflict of interest as a result of investment transactions for clients not being prioritised.

Required:
Discuss five basic procedures that might be adopted by the market regulator in your country to address the conflicting areas created by personal investing. (10 marks)

(b) Health Service is a foundation created with the purpose of supporting Allcare Hospital which has a spending budget of Sh.111 million. Expenses incurred by Health Service foundation average 0.45% of total assets. The foundation will also require Sh.40 million to acquire a new facility at the hospital. The foundation's portfolio has a market value of Sh.2,000 million.

The foundation's board of directors has designated a portion of the portfolio to serve as a reserve of approximately 15% of its spending budget for the hospital to ensure that the foundation's annual spending goals are met.

The board of directors is aware of the market risk-return trade off and is willing to accept the risk necessary to support the foundation's long term growth, with respect to return on investable assets. The board has agreed that a shortfall risk limit defined as expected total return minus two standard deviations of -14% in any one year is acceptable.

A consultant has developed five alternative portfolios as shown below:

Alternative portfolio asset allocation (%)

Asset class	A	B	C	D	E
Cash equivalents	1	2	4	3	6
Intermediate term bonds	20	23	10	15	15
High yield corporate bonds	16	25	20	25	25
Equities-domestic	35	35	20	30	24
Equities-non domestic	13	5	25	15	15
Real estate investment trust	15	10	21	12	15
Total	100	100	100	100	100

Portfolio measures	Alternative portfolios				
	A	B	C	D	E
Expected annual total return (%)	8.42	7.59	8.77	8.13	7.90
Expected standard deviation (%)	11.18	10.31	11.54	10.85	10.28

Required:
Recommend the portfolio with the most appropriate strategic asset allocation for Health Service foundation. Show your computations. (10 marks)

(Total: 20 marks)

QUESTION THREE

(a) Analyse four challenges in the application of the asset-based valuation model in a company. (6 marks)

(b) A manager is considering a collateralised mortgage obligation (CMO) structure. The structure has three tranches namely; A, B and C with a monthly coupon rate paid to each tranche.

Tranche C is an accrual tranche that accrues coupon interest monthly.

Tranche	Coupon rate (%)	Par amount outstanding Sh."million"
A	6	3
B	7	8
C	8	30

Based on some prepayment rate, the projected principal payment for the next 5 months is provided below:

Month	Scheduled principal repayment plus prepayment Sh."000"
1	520
2	510
3	490
4	450
5	448

Required:
(i) The cash flow for tranche A. (6 marks)

(ii) Average life for tranche A. (3 marks)

(c) Consider a collateralised debt obligation (CDO) that has a Sh.250 million structure. The collateral consists of bonds that mature in 7 years, and the coupon rate for these bonds is the 7-year treasury rate plus 500 basis points. The senior tranche comprises 70% of the structure and has a floating coupon treasury bill rate plus 50 basis points. There is only one junior tranche that comprises 20% of the structure and has a fixed coupon of 7-year treasury rate plus 300 basis points.

The 7-year treasury rate is 6% and the treasury bill rate is currently 7.5%. There are no defaults in the underlying collateral pool.

Ignore the collateral manager's fees and any other expenses.

Required:
The rate of return earned by the equity tranche in percentage. (7 marks)

(Total: 20 marks)

QUESTION FOUR

(a) In relation to collective investment schemes (CIS), describe the two forms of pricing used to determine the net asset value (NAV) price. (4 marks)

(b) Discuss three circumstances that might cause an upward bias in the calculation of the Sharpe ratio. (6 marks)

(c) Explain the roles played by five interested parties in a defined benefit pension plan. (10 marks)

(Total: 20 marks)

QUESTION FIVE

(a) (i) Explain three reasons that might justify the existence of secondary mortgage markets. (6 marks)

(ii) Define the term "mortgage backed security" as used in secondary mortgage markets. (1 mark)

(iii) Describe two types of mortgage backed securities. (4 marks)

(b) Kimunye Ltd. is considering adding the following three properties to the real estate portfolio:

Property A:

Property A has an estimated after tax cash flow shown below and is available for Sh.6.39 million. Investment in the property would be 100% equity. The firm has an effective margin tax rate of 30%.

Year	Estimated after tax cash flows Sh. "million"
1	0.26
2	0.44
3	0.74
4	0.91
5	6.11

Property B: Analysis of property B includes an assessment of its eventual sale.

Information regarding the sale of property B are as follows:

Sales price	Sh.5,000,000
Selling expenses	10% of sales price
Purchase price	Sh.3,200,000
Accumulated depreciation	Sh.600,000
Mortgage balance outstanding	Sh.1,000,000
Marginal tax rate is at 30%	

Property C: The acquisition cost of property C is Sh.2.3 million. If property C is purchased, 55% of the purchase price will be borrowed at 9.0% through an amortising mortgage with a 25 year term and monthly compounding. The remaining funds will come from an equity investment. The firm's required rate of return for equity investment in properties is 14.5%.

Required:

(i) The after tax return for property A. (3 marks)

(ii) The after tax equity reversion for property B. (3 marks)

(iii) Using the band of investment method, determine the capitalisation rate for property C. (3 marks)

(Total: 20 marks)

STAR COLLEGE OF MANAGEMENT STUDIES

KASNEB

ASSET MANAGEMENT

CSIA PART III SECTION 5

FRIDAY: 7 June 2013.

0728 776317

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Analyse three methods of restructuring a mortgage loan. (6 marks)

(b) Talex Limited is considering to construct a new office building that is expected to produce net operating income (NOI) of Sh.50 million during the year 2014. The building is expected to have an economic life of 75 years. During this period, the income is expected to increase by an average of 3 per cent per year. A 13 per cent investment yield would be necessary to attract an investor in the building and the income from the building will continue forever.

Required:

(i) The estimated value of the property after 5 years. (4 marks)

(ii) The amount the investor is expected to receive when the property is sold, if the investor intends to purchase the property in (b)(i) above with the expectation of selling it after a 5-year holding period. (2 marks)

(c) Latex Development Company has three plots of land to sell: Ndogo, Wastani and Kubwa whose price per plot is Sh.1,900,000, Sh.4,560,000 and Sh.4,750,000 respectively. These plots are sold on a loan which will be repaid at 120% of the rate at which revenue will be received. The total loan amount equals Sh.469,105,200 and the gross project value is Sh.684,000,000.

Required:
The release price for each type of plot. (8 marks)
(Total: 20 marks)

QUESTION TWO

(a) Explain two elements of the return for the junior note holders in a synthetic collateralised debt obligation (CDO) structure. (4 marks)

(b) Argue the case for issuing synthetic balance sheet collateralised debt obligation (CDO) by banks. (4 marks)

(c) An issuer is considering the following two collateralised mortgage obligation (CMO) structures:

Structure I

Tranche	Par amount Sh."million"	Coupon rate %
A	150	6.50
B	100	6.75
C	200	7.25
D	150	7.75
E	100	8.00
F	500	8.50

Tranches A to E are a sequence of planned amortisation class (PAC) and tranche F is the support tranche.

Structure II

Tranche	Par amount Sh."million"	Coupon rate %
A	150	6.50
B	100	6.75
C	200	7.25
D	150	7.75
E	100	8.00
F	200	8.25
G	300	?

Tranches A to E are a sequence of planned amortisation class (PAC), tranche F is a PAC II and tranche E is a support tranche without a schedule.

Required:

(i) In structure II, tranche G is created from tranche F in structure I. Compute the coupon rate for tranche G assuming that the combined coupon rate for tranche F and tranche G in structure II is 8.5%.

(ii) Explain whether there is an effect on the value and average life of tranches A to E by including the PAC II in structure II. (3 marks)

(iii) Discuss the difference in the average life variability of tranche G in structure II, and tranche F in structure I. (3 marks)
(Total: 20 marks)

QUESTION THREE

(a) Appraise six methods used to value private equity portfolio companies. (6 marks)

(b) A buyout transaction is valued at Sh.1billion and has the following characteristics:

1. Exit occurs in five years at a projected multiple of 1.80 of the firm's initial cost. It is financed by debt and equity in the proportion of 60% and 40% respectively.
2. The Sh.400 million equity investment is composed of:
   - Sh.310 million in preference shares held by the private equity firm.
   - Sh.80 million in equity held by the private equity firm.
   - Sh.10 million in equity held by management equity participation.
3. Preference shares are guaranteed a 14% compound annual return payable at exit.
4. The equity of the private equity firm is promised 90% of the firm's residual value at exit after creditors and preference shares are paid. Management equity receives the other 10% residual value.
5. By exit, the firm will have paid off Sh.350 million of the initial Sh.600 million in debt using operating cash flow.

Required:
The payoff multiple for the equity claimants (private equity). (8 marks)

(c) A client who consults you on investment advice, has recently inherited Sh.1,200,000 and has above average risk tolerance (risk aversion) of 2. The client intends to earn returns that will outpace inflation in the long term. The client expects to liquidate Sh.60,000 to cater for the down payment of an asset purchase. If the need arises, the client states that it is important to be able to take out the Sh.60,000 without invading the initial capital of Sh.1,200,000.

Below are strategic asset allocation choices for the client.

Investor's forecast

Asset allocation	Expected return %	Standard deviation of return %
A	10	20
B	7	10
C	5.25	5

Required:
(i) Based on risk adjusted expected returns and Roy's safety first criterion, recommend a strategic asset allocation for the client. (5 marks)

(ii) Determine the shortfall level, given the client's desire not to invade the Sh.1,200,000 principal. (1 mark)
(Total: 20 marks)

QUESTION FOUR

(a) (i) Explain the term "dark pool trading system". (2 marks)

(ii) Describe two disadvantages of "dark pool trading system". (2 marks)

(b) Below is the performance of two asset managers who are not responsible for cash inflows-outflows to a portfolio.

Portfolio A

	Sh."000"
Beginning value	2,000
Ending value year 1	2,400
Withdrawn at end of year 1	800
Ending value year 2	1,440

Portfolio B

	Sh."000"
Beginning value	1,000
Ending value year 1	1,200
Added at end of year 1	1,000

Ending value year 2   1,980

The annualised internal rate of return of portfolio A and B is 7.1870% and -0.6682% respectively.

Required:

(i)   Argue the case against the use of internal rate of return (IRR) in evaluation of performance of an asset manager.

           (2 marks)

(ii)   Compare the performance of the two asset managers.

           (4 marks)

(c)   A client has picked three asset managers who will manage against the following benchmarks:

A1:   Global equity index (passive).
A2:   Global equity index (active).
A3:   Global government bond index (passive).

The expected active returns, tracking errors and the management fees of all managers are provided below:

Manager	Expected active return before fees (%)	Tracking error (%)	Management fees (%)
A1	0.03	0.20	0.05
A2	3.50	5.00	0.40
A3	0.00	0.10	0.03

The strategic asset allocation of the fund is 50% equities and 50% bonds. The client seeks to achieve an expected active return of 1.5% after cost.

Required:

The percentage of the overall portfolio that the client will allocate to the three asset managers to achieve the desired results.

           (4 marks)

(d)   A tranche of a mortgage backed security has been split to create a floater with a principal of Sh.66,666,667 and an inverse floater of Sh.33,333,333. The tranche has a coupon rate of 8%.

Required:

(i)   The cap rate for the inverse floater, when the coupon rate for the floater is 182 day Treasury bill plus 1%.

           (4 marks)

(ii)   The cap rate for the floater when the coupon rate for the floater is 182 day Treasury bill plus 1% and a floor is imposed on the inverse floater of zero.

           (2 marks)

           (Total: 20 marks)

QUESTION FIVE

(a)   XYZ mutual fund has the following assets and liabilities:

	Sh."000"
Stock (at current market value)	20,000
Bonds (at current market value)	10,000
Cash	500
Total value of assets	30,500
Liabilities	(300)
Net worth	30,200

The number of shares outstanding is 10 million. In the following year, the value of the stock portfolio held by the fund rises by 10% and the value of the bond portfolio falls by 2%.

Required:

(i)   Net asset values (NAV) before and after the rise.

           (5 marks)

(ii)   The yield on an investment in the mutual fund.

           (2 marks)

(iii)   Identify the different fee structures of investment funds.

           (3 marks)

(b)   Financial institutions around the world have undergone a series of financial crises in the recent years. Examine five examples of such financial crises.

           (5 marks)

(c)   Highlight five factors that might lead to reluctance of pension funds becoming involved in real estate as equity investors.

           (5 marks)

           (Total: 20 marks)

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a)   Explain six major ranges of collateralised mortgage obligations (CMO) structures.

           (12 marks)

(b)   James Shilungu has Sh.800,000 in cash and Sh.1.2 million in a real estate index fund. He has appointed you to discuss the management of his assets. At the meeting with James, you note that he is an aggressive investor but does not want the value of his portfolio to fall below Sh.1 million. You determine that a constant proportion portfolio insurance with a 130 per cent cushion is appropriate for James Shilungu. During the next quarter, the property market experiences a boom resulting in an eight per cent quarterly return on the real estate index fund. The return on cash investments is zero for the quarter.

Required:

Determine the size of the rebalancing trade appropriate for James Shilungu at the end of the quarter.

           (8 marks)

           (Total: 20 marks)

QUESTION TWO

(a)   Explain the effects of the following characteristics of a hedge fund index:

(i)   Survivorship bias.

           (2 marks)

(ii)   Value weighting bias.

           (2 marks)

(iii)   Stale price bias.

           (2 marks)

(b)   Celtec Financial Services Ltd., a well established investment bank, submits a weekly column to "investments weekly" magazine. Once published, the column usually affects the value of the shares discussed in the weekly column. Jasper Mutua, an employee of Celtec Financial Services Ltd., knows that investments weekly magazine is published by African publishing. Jasper Mutua's nephew, Joram Kiamba, faxes him an advance copy of the Celtic Financial Services Ltd.'s article before the magazine is printed and distributed to the public. Jasper Mutua regularly trades in investments weekly magazine and to date, he has realised a personal profit of Sh.2 million as well as significant profits for his clients.

Required:

With reference to the information given above, explain the ethical standard(s) violated by Jasper Mutua.   (5 marks)

(c)   The following information relates to Neno Apartments for the year ended 30 November 2012:

1.   The gross income for the year was Sh.2,400,000. The vacancy and collection losses are 2.5% of the potential gross income.
2.   Operating expenses excluding property management fees is Sh.660,000.
3.   Property management fees is 4%. The outstanding mortgage on the property is Sh.20 million while its purchase price was Sh.70 million.
4.   The annual debt service, including the principal, is Sh.1,060,000 per year.

Required:

(i)   The cap rate.

           (5 marks)

(ii)   The return on equity (ROE).

           (4 marks)

           (Total: 20 marks)

QUESTION THREE

(a)   Discuss five characteristics of property investments.

           (10 marks)

(b)   Describe three types of mortgage designs.

           (3 marks)

(c)   John Rutere, a manager at BET Asset Management, decides to make an investment in CCM Group of Companies. At 2.00 p.m., the broker receives an order from John Rutere to buy 100,000 shares of CCM Group of Companies. The current market price is Sh.15 per share. The broker was given a discretion with regard to the timing and number of shares to be purchased. At the time the broker places a buy order, the market price is Sh.15.50 per share. An hour later, the broker manages to buy 60,000 shares at Sh.15.75 per share plus an additional Sh.0.05 commission. Due to market conditions, John Rutere cancels the remaining order of 40,000 shares. CCM Group of Companies closes the sale at Sh.16.00 per share on a volume of 120,000 shares. Ten days later, CCM Group of Companies closes the sale at Sh.18.00 per share.

Required:

The total trading cost for CCM Group of Companies investment on a per share basis.

           (7 marks)

           (Total: 20 marks)

QUESTION FOUR

(a) The Retirement Benefits Authority in your country requires each retirement benefits scheme to obtain the services of a registered fund manager. The fund manager must be licensed by the Retirement Benefits Authority on an annual basis.

Required:
Discuss four challenges that the fund manager is likely to face when managing the funds of the pension scheme's assets. (8 marks)

(b) Simon Mamba is a financial analyst working with Akimbo Investment Group. For the annual asset allocation review, Simon Mamba has prepared the set of market expectations shown below:

Capital market expectations

Asset class	Expected returns(%)	Standard deviation (%)	Correlations 1	2	3	4
1. Local equities	8.6	20	1.00			
2. Off-shore equities	6.7	15	0.65	1.00		
3. Local bonds	4.1	10	0.34	0.25	1.00	
4. Real estate	5.0	12	0.50	0.35	0.17	1.00

Based on the above capital market expectations, Simon Mamba has developed the following analysis:

Corner portfolios

Portfolio	Expected returns(%)	Standard deviation (%)	Sharpe ratio	Asset class portfolio weights (%) 1	2	3	4
1	8.60	20.00	0.330	100.00	0.00	0.00	0.00
2	7.91	16.78	0.352	63.53	36.47	0.00	0.00
3	7.55	15.48	0.358	53.22	37.43	0.00	9.55
4	5.03	8.42	0.360	0.00	24.70	43.3	32.00
5	4.69	8.15	0.329	0.00	10.90	55.56	33.53

Additional information:
1. Akimbo investment group's spending rate is 3.5%, the expected long-term inflation rate is 2.25% and the cost of investment returns has averaged 43.6 basis points annually.
2. Akimbo investment group has multiplicative returns requirement based on the spending rate, and the cost of earning investment return.

Required:
(i) Describe how corner portfolios arise. (2 marks)

(ii) Compute Akimbo Investments Group's return requirement in percent. (2 marks)

(iii) Contrast the calculated investment return requirement in (b) (ii) above to an additive return requirement based on the same input. (2 marks)

(iv) Recommend the strategic asset allocation that Simon Mamba should present for approval at the asset allocation review. (6 marks)
(Total: 20 marks)

QUESTION FIVE

(a) Explain four characteristics of benchmarks used by asset managers when monitoring fund performance. (8 marks)

(b) Hussein Menza bought 150,000 shares of HHH Limited on 1 January 2010 at a price of Sh.156.30 per share. A dividend of Sh.10 per share was paid on 1 January 2011. He did not reinvest this dividend.

On 1 January 2012, Hussein Menza collected a dividend of Sh.15 per share and sold the remaining shares at Sh.170 per share.

Required:
(i) The time weighted rate of return on Hussein Menza's portfolio. (7 marks)

(ii) Explain a set of circumstances under which money weighted rate of return would be an appropriate measure for Hussein Menza's portfolio. (2 marks)

(c) Highlight three advantages of using a synthetic collateralised debt obligation in comparison to cash collateralised debt obligation. (3 marks)
(Total: 20 marks)

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Assess six financial factors that an investor should take into consideration when making buy-versus-lease decisions on corporate real assets. (6 marks)

(b) Simon Kariuki wishes to invest in a collective investment scheme (CIS). He has learnt that you are pursuing the Certified Securities and Investment Analysts qualification and has therefore approached you for guidance on whether to invest in the collective investment scheme (CIS).

Required:
Evaluate seven benefits associated with collective investment schemes. (10 marks)

(c) A securities and investment analyst is using an analytical system to value tranche M of a collateralised mortgage obligation (CMO) deal. The Monte Carlo simulation model uses eight representative interest rate paths. The present value of each of the representative interest rate paths and the weight of each path are shown below:

Representative path	1	2	3	4	5	6	7	8
Weight of representative path (%)	20	18	16	12	12	12	6	4
Present value of representative path	70	82	79	68	74	86	91	93

Required:
Compute the theoretical value of tranche M. (4 marks)
(Total: 20 marks)

QUESTION TWO

(a) Explain four classes of fees for mutual funds. (4 marks)

(b) An investor's portfolio is currently worth Sh.1 million. During the year 2012, the investor sells 1,000 shares of Bobtel Ltd. at a price of Sh.80 per share and 2,000 shares of Dobtel Ltd. at a price of Sh.40 per share. The proceeds are used to buy 1,600 shares of Taptel Ltd. at Sh.100 per share.

Required:
Portfolio turnover rate. (3 marks)

(c) Mary Barasa, a securities analyst, has provided the following data for a particular period:

	Portfolio P	Market
Average return	35%	28%
Beta	1.20	1.00
Standard deviation	42%	30%
Tracking error (Non-systematic risk), α (e)	18%	0%

The treasury bill rate was 6% during the period.

Required:
Compute any four performance measures for portfolio P and the market. (8 marks)

(d) To mitigate the effects of the ongoing global financial crisis, professionals in the investment sector have put more concentration on the study of the securitisation process.

As a professional in this field, explain five basic parties involved in the process of securitisation. (5 marks)
(Total: 20 marks)

QUESTION THREE

(a) Describe the following financing and investment vehicles:
(2 marks)
(i) Mortgage pass through securities.

(ii) Mortgage pay-through bonds. (2 marks)

(iii) Collateralised mortgage obligations. (2 marks)

(b) Identify three factors that influence the pricing of a mortgage pass through security and a mortgage backed security. (3 marks)

(c) The coupon curve of prices for a pass through security for some months is as follows:

Coupon (%)	Price (Sh.)
7	94.00
8	97.06

9	99.50
10	102.60
11	105.25
12	106.19

Required:
Coupon curve duration for the 9% coupon pass through security. (5 marks)

(d) Examine three roles played by pooled assets fund managers. (6 marks)

(Total: 20 marks)

QUESTION FOUR

(a) All People University (APU) is an education institution with an _endowment fund_ for the purpose of providing financial support to supplement the university budget. The spending rule for the endowment is 4% of the market value of its investment portfolio as of the previous year. Last year's investment portfolio was Sh.500 million which represented 5% of the operating budget for All People University.

The University's operating expenses are expected to grow at a nominal rate of 5% per year. The inflation rate as measured by the central bureau of statistics (CBS) is 8% per year. The investment management expense is 0.65% and All People University expects a similar level of endowment support, indexed to inflation in its costs in future years.

Required:
(i) Formulate the return requirement for All People University (APU) endowment investment policy statement. (4 marks)

(ii) Interpret the answer in (a) (i) above. (2 marks)

(b) Explain the following two prepayment risks as applied in asset management:

(i) Contraction risk. (2 marks)

(ii) Extension risk. (2 marks)

(c) In relation to credit card receivable backed securities:

(i) Explain the term "lock out period". (2 marks)

(ii) Discuss the importance of monthly payment rate (MPR). (4 marks)

(d) Summarise four risks faced by the defined benefit pension plans. (4 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Explain five characteristics of angel financing investments. (5 marks)

(b) Discuss three categories of credit enhancement mechanism. (6 marks)

(c) James Kamakal has received the dealer quotes on mortgage backed securities (MBS) given below in basis points (bps).

Dealer Quotes

Tranche	Option Adjusted Spread (bps)	Zero volatility Spread (bps)	Nominal Spread (bps)	Effective Duration (Years)
A	50	60	68	1.50
B	70	80	85	3.00
C	30	120	128	5.00
D	80	150	156	4.00
Support I	35	165	178	11.00

Required:
(i) For each tranche, generate the cost of embedded option in basis points. (3 marks)

(ii) The most expensive tranche in terms of option cost. (3 marks)

(d) Benson Birungu, a Certified Securities and Investment Analyst manages a pool of assets for several wealthy clients. Recently, Bernard Mutaku, one of the clients informed Benson Birungu that he was under investigation by revenue authority officials for tax evasion related to his business. After learning about the investigations, Benson Birungu shared the information with a friend who worked at a local investment bank which was underwriting an initial public offering for one of Bernard Mutaku's firms.

Required:
Citing relevant reasons, explain whether Benson Birungu violated the code of ethics and standards of practice in the investment sector. (3 marks)

(Total: 20 marks)

CSIA PART III SECTION 5 ASSET MANAGEMENT

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

(a) Differentiate between "principal only strips" and "interest only strips". (6 marks)

(b) A pool of mortgage loan is facing default due to the difficult economic conditions in the region. The default loan balance for month 66 is Sh.10 million. The beginning mortgage balance and scheduled principal payment for month 66 is Sh.2,500 million and Sh.6 million respectively.

Required:
Compute the conditional default rate (CDR). (4 marks)

(c) A manager for a pool of a collateralised mortgage obligation faces increasing pressure from investors facing reinvestment risk to create an accrual tranche or a Z bond. The parent tranche from which the Z bond is being created has a face value of Sh.150 million with a coupon rate of 10% and a lock out of 8 years.

Required:
(i) Calculate the amount of face value of the Z bond to be created. (4 marks)

(ii) Outline to the manager how he could increase the amount of the Z bond created. (2 marks)

(d) Identify the steps used in the monte carlo simulation methodology to value a mortgage security. (4 marks)

(Total: 20 marks)

QUESTION TWO

(a) Discuss four advantages of the swap curve over a government bond yield curve. (8 marks)

(b) Blue Lake Ltd., a local fund management with a mandate to invest through third parties has invested in a global asset management company. The following information relates to new capital, operating results and redemptions of the global asset manager of an investment fund, who follows a strategy of investing in a variety of portfolio companies:

Year	2005 Sh."million"	2006 Sh."million"	2007 Sh."million"	2008 Sh."million"	2009 Sh."million"	2010 Sh."million"
New capital	50	15	10	25	10	5
Realised results	0	0	10	35	40	80
Unrealised results	-5	-15	15	10	15	25
Redemptions	0	0	0	25	45	75

The global asset manager charges a management fee of 2% and a carried interest of 20%. The actual size of the fund is Sh.125 million. Blue Lake Ltd. has decided to evaluate the performance of the fund by calculating the net internal rate of return (IRR) to determine whether to add more funds or liquidate some of the investments held with the global asset management company.

Required:
Calculate the net IRR. (12 marks)

(Total: 20 marks)

QUESTION THREE

(a) Explain four perspectives of real estate analysis to a real estate developer. (8 marks)

(b) Mr. Daniel Barozi intends to purchase (through a mortgage arrangement) an apartment valued at Sh.12 million. The mortgage provider requires 10% deposit in order to finance the mortgage. In addition, Mr. Barozi will be required to pay legal fees of 2% of the value of the house and an insurance of 0.1% which are factored within the contract and are once off upfront deductions.

The mortgage rate is 11.89% per annum calculated on a reducing balance basis. The repayment period is 15 years.

Required:
Calculate the monthly loan repayment, Mr. Barozi would be expected to pay. (6 marks)

(c) A twenty year lease on an industrial unit is to be assigned. The lease provides for only one rent review after ten years and has an unexpired term of four years.