



CICT PART III SECTION 5

MOBILE APPLICATION DEVELOPMENT

THURSDAY: 23 May 2019.

Time Allowed: 3 hours.

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

**QUESTION ONE**

- (a) Summarise four challenges of building occasionally connected applications (OCA's) that allow a remote worker to continue to access their data while on the move. (4 marks)
- (b) Highlight four main features that could be retrieved under #import "<UIKit/UIKit.h> directive. (4 marks)
- (c) (i) Identify two areas where unstructured supplementary service data (USSD) code are widely used in business. (2 marks)
- (ii) State two tools that might be used by a malicious person to perform USSD attacks. (2 marks)
- (d) When a USSD code is dialled it presents a user with the following screen:
- "Pick your choice"
1. Loan
2. Account balance.
- If the response from the user is "1" then he is presented with the following options:
1. Loan balance
2. Interest.
- If the response is "2" then he is given an account balance.
- If the response is \*1\*1# the user is given loan balance.
- If the response is \*1\*2 # the user is presented with interest.
- Required:**  
Write a USSD code to perform the above tasks. (6 marks)
- (e) Describe two test scenarios that would allow you to perform localisation testing for your app on a device. (2 marks)  
**(Total: 20 marks)**

**QUESTION TWO**

- (a) In country X, the security charges are done per region by private security firms. There is a fixed charge of Sh.5,000. Region A is charged of Sh.20,000, B is charged Sh.30,000 while C is charged Sh.40,000. All these charges are levied monthly.
- Required:**  
Write an objective C program to calculate monthly charges by allowing a user to input the respective region. (6 marks)
- (b) Explain the following terminologies as used in mobile application development:
- (i) Wireless Markup Language (WML). (2 marks)
- (ii) CLDC configuration. (2 marks)
- (c) Highlight two benefits of web apps over mobile apps. (2 marks)

- (d) (i) Android has developed a new Internet Of Things (IOT) operating system called “Android Things”.  
Explain IOT as used in computing. (2 marks)
- (ii) State three barriers to adoption of IOT in developing nations. (3 marks)
- (e) Apart from speed consideration, examine three factors to consider when choosing your mobile development platform. (3 marks)
- (Total: 20 marks)**

### QUESTION THREE

- (a) Explain two uses of command line tools in mobile phones. (2 marks)
- (b) Consider the objective C code shown below:

```
#import < Foundation/Foundation.h >
int main (int argc, const char * argu [ ] ) {
    NSAutoreleasePool Pool = [[NSAutoreleasePool alloc] int] ;
    int i = 2
    do
        NSLog (“ The value of i is ==> %c” , );
        While (1< 10);
    [Pool drain] ;
    Return 0 ;
}
```

#### Required:

- (i) Identify the errors in the program. (4 marks)
- (ii) Rewrite the code using the “for loop”. (4 marks)
- (c) Write a code snippet to generate a button dynamically. (4 marks)
- (d) Using a suitable diagram, illustrate the concept of secure boot chain as used in Apple iOS security. (6 marks)
- (Total: 20 marks)**

### QUESTION FOUR

- (a) Examine three main phases of mobile Internet protocol. (6 marks)
- (b) John, a webmaster in ABC Boys Secondary School is in need of a widget to show the progress of a task on their school web app.

#### Required:

- (i) Write code snippet to initialise the progress bar ( ) method using a div element from JQuery UI library. (2 marks)
- (ii) Write a JQuery code snippet that shows the user interface (UI) progress bar of a task on a web app. (4 marks)
- (c) An application is required in swift programming language so as to run in IOS operating system. The application places students in various colleges depending on one’s average grade as shown below:

Average Grade	College
A	Top University
B	Technical University
C	Technical College
D	Certificate College
E	No Placement
Any other	Wrong grade

**Note:**

A function called grading returns the average grade given the student ID.

**Required:**

Create a function named selection to perform the placement described above.

(8 marks)

**(Total: 20 marks)**

**QUESTION FIVE**

(a) Study the iOS code below:

```
#import <UIKit/UIKit.h>
@class ViewController ;
@interface AppDelegate : UIResponder < UIApplication Delegate >
@property (strong, nonatomic) UIWindow * window ;
@property (strong, nonatomic) ViewController * viewController ;
@end
```

**Required:**

Interpret the program flow logic based on the given code items.

(4 marks)

(b) Study the Android code below:

(i) Intent i = new Intent (this, TargetActivity.class) ;  
i.putExtra ("Key1", "ABC") ;  
i.putExtra ("Key2", "123") ;  
StartActivity ( i )

(ii) Intent i = new Intent (Intent.ACTION\_VIEW,  
Uri.parse ("https://www.kasneb.or.ke")) ;  
startActivity ( i )

(2 marks)

**Required:**

Giving reasons, justify which of the two is an implicit intent and which one is an explicit intent.

(4 marks)

(c) Assess four techniques used to reduce lock contention in mobile phones.

(4 marks)

(d) Your company is considering developing a mobile app for its operations. The mobile development team advises the management to create an android app instead of an iOS application.

Giving reasons, support the advice of the mobile development team.

(4 marks)

(e) With the aid of an example, explain closure in the context of mobile computing.

(4 marks)

**(Total: 20 marks)**

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