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DICT LEVEL II

COMPUTER NETWORKING

MONDAY: 27 November 2017.

Time Allowed: 3 hours.

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

**QUESTION ONE**

- (a) Explain the meaning of the following terms as used in computer networking:
- (i) Network address translation (NAT). (2 marks)
  - (ii) Domain name system (DNS). (2 marks)
  - (iii) Ethernet. (2 marks)
- (b) Highlight six inherent characteristics of a wireless data communication system which make it attractive to many users. (6 marks)
- (c) With the aid of a diagram, describe the physical structure of each of the following transmission media:
- (i) Coaxial cable. (4 marks)
  - (ii) Fibre optic cable. (4 marks)
- (Total: 20 marks)**

**QUESTION TWO**

- (a) Nodes connected in a cyclical structure are said to be in a ring topology:
- Required:**
- (i) Explain the technique used to eliminate collision in a ring topology. (2 marks)
  - (ii) Outline three advantages and three disadvantages of a ring topology. (6 marks)
- (b) Distinguish between “transmission control protocol (TCP)” and the “user datagram protocol (UDP)”. (4 marks)
- (c) Mbuni secondary school recently purchased stand-alone computers for their new computer laboratory. Specifying the purpose in each case, identify four components that Mbuni Secondary School would require in order to network the laboratory. (8 marks)
- (Total: 20 marks)**

**QUESTION THREE**

- (a) Using illustrations, differentiate between a “link-local address” and a “loopback address” as used in computer networking. (4 marks)
- (b) State whether you would use a cross-over cable or a straight through cable when connecting each of the following devices using CAT 6 cables:
- (i) Switch and switch. (1 mark)
  - (ii) Computer and switch. (1 mark)
  - (iii) Router and router. (1 mark)
  - (iv) Computer and router. (1 mark)

- (c) A network administrator will require to undertake a series of steps when subnetting a logical address to connect to different networks.
- Explain three major steps needed to subnet a logical address. (6 marks)
- (d) Explain the role of the following network troubleshooting tools:
- (i) Pathping. (2 marks)
  - (ii) Ipconfig. (2 marks)
  - (iii) Route. (2 marks)
- (Total: 20 marks)**

**QUESTION FOUR**

- (a) Explain the role of the following servers in a networked environment:
- (i) Syslog server. (2 marks)
  - (ii) NTP server. (2 marks)
  - (iii) TFTP server. (2 marks)
- (b) Impairment could introduce errors into digital signals being transmitted in a transmission medium. Noise is the main cause of signal impairment.
- Required:**  
Explain three types of noise during signal transmission. (6 marks)
- (c) Explain the following characteristics of a client/server network:
- (i) Resource sharing. (2 marks)
  - (ii) Scalability. (2 marks)
  - (iii) Integrity. (2 marks)
  - (iv) Passive. (2 marks)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) "Backbone is a term used to describe the cables handling major network traffic".
- Describe three components of backbone cabling. (6 marks)
- (b) Wide area networks (WANs) have become universal types of networks in many organisations.
- With respect to the above statement, distinguish between each of the following technologies used to implement wide area networks (WANs):
- (i) "Cellular broadband" and "satellite broadband". (4 marks)
  - (ii) "Circuit switching" and "packet switching". (4 marks)
- (c) Analyse three challenges of wireless devices. (6 marks)
- (Total: 20 marks)**
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