

Time: 3 Hours

**DECEMBER 2014**

Max. Marks: 100

*PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.*

**NOTE:** There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated

**Q.1 Choose the correct or the best alternative in the following: (2×10)**

- a. Ethernet corresponds to \_\_\_\_\_ standard.
- (A) IEEE 802.3 (B) IEEE 802.11  
(C) IEEE 802.15 (D) IEEE 802.16
- b. As the data packets move from the upper to the lower layers, headers are \_\_\_\_\_.
- (A) Added (B) Removed  
(C) Rearranged (D) Modified
- c. If a symbol is composed of 4 bits. There are \_\_\_\_\_ data levels.
- (A) 2 (B) 4  
(C) 8 (D) 16
- d. The HDLC \_\_\_\_\_ field defines the beginning and end of a frame.
- (A) Flag (B) Address  
(C) FCS (D) Control
- e. \_\_\_\_\_ is the access protocol used by wireless LAN.
- (A) CSMA (B) CSMA/CD  
(C) CSMA/CA (D) CDMA
- f. IP address in IPv6 consists of \_\_\_\_\_ bits.
- (A) 4 (B) 8  
(C) 32 (D) 128

- g. UDP and TCP are \_\_\_\_\_ layer protocols.
- (A) Physical (B) Data link  
(C) Network (D) Transport
- h. \_\_\_\_\_ is the maximum size of the data portion in IP datagram.
- (A) 65, 535 bytes (B) 65, 515 bytes  
(C) 65, 475 bytes (D) 65, 460 bytes
- i. Wireless transmission is \_\_\_\_\_ prone to error than wired transmission.
- (A) Less  
(B) More  
(C) Half  
(D) none of these
- j. Which type of switching uses the entire capacity of a dedicated link?
- (A) Circuit switching (B) Datagram packet switching  
(C) Message switching (D) Virtual circuit packet

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**Answer any FIVE Questions out of EIGHT Questions.  
Each question carries 16 marks.**

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- Q.2** a. With the help of block diagram, explain the salient feature of a data communication model. (7)
- b. Discuss service primitive types for confirmed and unconfirmed services with the help of sequence diagrams. (6)
- c. Define the key features of a protocol. (3)
- Q.3** a. Given a channel capacity of 20 Mbps, The bandwidth of the channel is 3MHz. What signal to noise ratio is required to achieve this capacity? (5)
- b. Explain the degradation of signal quality due to attenuation and delay distortion. (6)
- c. Describe the characteristics of optical fiber which distinguish them from twisted pair or co-axial cable. (5)
- Q.4** a. Explain the various digital signal encoding schemes with relevant waveforms. (8)

b. Given the generator polynomial as  $(x^4 + x + 1)$  and the message bits 1101101, obtain the CRC code. (5)

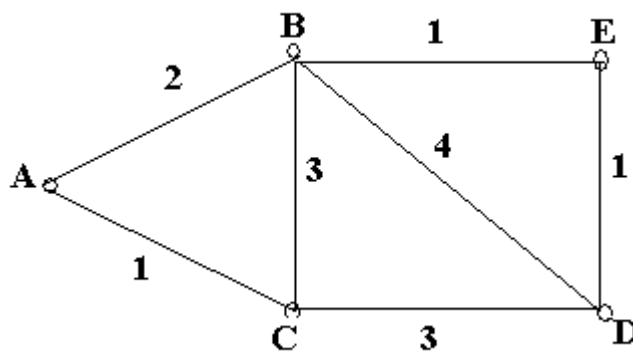
c. Differentiate between full duplex and half duplex transmission. (3)

**Q.5** a. With suitable illustration, explain stop- and -wait ARQ. (8)

b. Describe synchronous TDM with relevant diagrams. (8)

**Q.6** a. Discuss the switching technique used for virtual circuit approach. (8)

b. Find the shortest path from A to D for the network shown. (6)



c. Explain how congestion occurs in a network? (2)

**Q.7** a. Discuss the spanning tree approach to prevent loop of bridges. (6)

b. Explain gigabit Ethernet configuration with an example. (6)

c. Explain adhoc networking with a diagram. (4)

**Q.8** a. Explain the function of each field in IPv4 header. (8)

b. Differentiate between IPv4 and IPv6. (4)

c. A class B network has a subnet mask of 255.255.240.0 What is the maximum number of hosts per subnet? (4)

**Q.9** a. Draw the TCP header format and brief the function of each field. (8)

b. Discuss the basic e-mail operation with a diagram illustrating SMTP mail flow. (8)