ROLL NO. _____

**Code: AE71/AC67/AT67/AE119/AC119/AT119**
**Subject: DATA COMM. & COMPUTER NETWORKS**

# AMIETE – ET/CS/IT (Current & New Scheme)

**Time: 3 Hours** **JUNE 2017** **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**

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

a. The layer which provides reliable transparent transfer of data between end points is _____ layer.
**(A)** Presentation **(B)** Physical
**(C)** Transport **(D)** Network

b. Due to delay distortion, some of the signal components of one bit position will spill over into other bit positions, causing, _____.
**(A)** Equalization **(B)** Attenuation
**(C)** Cross talk **(D)** Inter Symbol Interference

c. In the _____ code, there is a transition at the middle of each bit period.
**(A)** Polar NRZ **(B)** Manchester
**(C)** AMI **(D)** Unipolar RZ

d. In TDM hierarchy of DS-1 transmission format, the basic data rate is _____.
**(A)** 15.44Mbps **(B)** 25.4Mbps
**(C)** 2.54Mbps **(D)** 1.544Mbps

e. In the _____ approach, a preplanned route is established before any packets are sent.
**(A)** virtual circuit **(B)** Datagram
**(C)** Circuit switching **(D)** Message switching

f. If the switch receives packets faster than it can send them for an extended period of time, then the switch will run out of buffer space, and some packets will have to be dropped. The switch operating in this state is said to be _____
**(A)** Congested **(B)** Digested
**(C)** Over-loaded **(D)** Loaded

g. The Shannon channel capacity for a telephone channel with bandwidth of 3400 Hz and SNR of 40db is _____ .
**(A)** 145.2kbps **(B)** 93.2kbps
**(C)** 45.2kbps **(D)** 18.4kbps

h. A network which extends less than 1 km is _____.
**(A)** Local Area Network (LAN)
**(B)** Wide Area Network (WAN)
**(C)** Metropolitan Area Network (MAN)
**(D)** Virtual Area Network (VAN)

i. Class B default subnet mask is
**(A)** 255.255.255.0 **(B)** 255.255.0.0
**(C)** 255.0.0.0 **(D)** 255.255.255.255

j. The address bits of IPv6 is _____ bits.
**(A)** 64 **(B)** 128
**(C)** 32 **(D)** 256

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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 neat block diagram, explain the Key Elements of the Internet. **(6)**

b. Explain the functions performed by the following layers of OSI model: **(2×3)**
(i) Physical layer
(ii) Data link layer
(iii) Presentation layer

c. Compare OSI reference model with TCP/IP model. **(4)**

**Q.3** a. With the help of neat diagram, explain Optical Fiber Transmission Modes. **(6)**

b. Briefly discuss different types of transmission impairments. **(6)**

c. Consider a receiver with an effective noise temperature of 294 K and a 10-MHz bandwidth. Find the thermal noise level at the receiver's output. **(4)**

**Q.4** a. Represent the binary data 100110001 in
(i) NRZ-I (ii) Pseudo ternary
(iii) Bipolar –AMI (iv) Manchester
(v) Differential Manchester Encoding format **(5)**

b. Explain different modulation techniques for digital data. **(5)**

c. In a CR code, the message bits are given by D = 1010001101 and Pattern P = 110101. Find the transmitted code word. **(6)**

**Q.5** a. With reference to HDLC, explain the following:
(i) Types of stations
(ii) Link configuration
(iii) Data transfer mode **(6)**

b. With the help of neat diagram, explain synchronous TDM system. **(5)**

c. Explain the working of Stop-and-Wait ARQ. **(5)**

**Q.6** a. Explain the congestion control mechanism in packet switching networks. **(6)**

b. Find the shortest path between nodes for the network shown in figure 6(b) using Dijkstra's algorithm. **(6)**

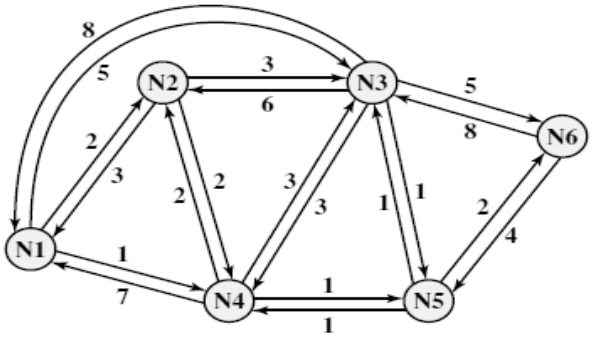


Figure 6(b)

c. Give the comparisons between circuit switching and packet switching. **(4)**

**Q.7** a. Discuss how two LANs are Connected by a Bridge? Explain with neat diagrams. **(6)**

b. With neat diagram, explain IEEE 802.3 Frame Format. **(6)**

c. Briefly discuss the important requirements for wireless LANs. **(4)**

**Q.8** a. Discuss creation of two fragments from an original IP datagram. Explain with an example. **(4)**

b. With the help of neat diagram, explain IP-4 header format. **(8)**

c. Mention the address class for the following IP addresses
(i) 132.133.144.156 (ii) 122.5.23.6
(iii) 195.13.14.126 (iv) 232.52.25.25 **(4)**

**Q.9** a. Briefly explain few practical applications of multicasting. **(4)**

b. With the help of neat diagram, explain TCP header. **(6)**

c. Briefly explain DNS Name Resolution. **(6)**