



(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 110601**

Roll No.

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**B. Tech.**

(SEM. VI) THEORY EXAMINATION, 2014-15  
**COMPUTER NETWORK**

Time : 3 Hours]

[Total Marks : 100

**NOTE: ATTEMPT ALL QUESTIONS.**

1 ATTEMPT ANY FOUR :

(5×4=20)

- (a) Differentiate between Bit rate and baud rate. A modem constellation diagram has data point at coordinates: (1,1), (1,-1), (-1,1) and (-1,-1). How many bps can a modem with these parameters achieve at 1200 baud? State two reason for using layered protocols.
- (b) What are the number of cable links required for n devices connected in mesh, ring, bus and star topology?
- (c) Calculate the required Bandwidth, if in a communication channel the signal power is 10 W, and the information transmission rate is 10kbps.
- (d) It is required to transmit a data at a rate of 64 kbps over a 3 kHz telephone channel. What is the minimum SNR required to accomplish this?
- (e) What do you mean by service primitives?
- (f) Discuss the services of each layer of OSI reference model.

**2 ATTEMPT ANY FOUR : (5×4=20)**

- (a) Given a 10-bit sequence 1010011110 and a divisor of 1011. Find the CRC. Check your answer.
- (b) Answer the following :
  - (i) A pure Aloha network transmits 200 bit frames on shared channel of 200 kbps. What is the through put if the system (all station together) produces 250 frames per second?
  - (ii) How can you compare pure Aloha and slotted Aloha?
- (c) Discriminate between the send window and receive window for link and how are they related with-
  - (i) A selective repeat retransmission scheme
  - (ii) A go-back-N control scheme
- (d) Discuss different carrier sense protocols. How are they different than collision protocols?
- (e) Sketch the Manchester and differential Manchester encoding for the bit stream: 0001110101
- (f) Discuss the different physical layer transmission media.

**3 ATTEMPT ANY TWO : (10×2=20)**

- (a) Write short notes on following:
  - (i) Stop and wait ARQ
  - (ii) Sliding Window Protocol
  - (iii) Go-Back N ARQ
  - (iv) Collision Avoidance

- (b) Perform the subnetting of the following IP address 160.11.X.X. Original subnet mask 255.255.0.0 and Number of subnet 6 (six)
- (c) What is the transmission time of a packet sent by a station if the length of the packet is 2 million bytes and the bandwidth of the channel is 300 kbps?

4 ATTEMPT ANY TWO : (10×2=20)

(a) Draw the diagram of TCP header and explain the use of the following:

- (i) Source and destination port addresses
- (ii) Sequence and acknowledgement numbers
- (iii) Code bits
- (iv) Window size
- (v) Urgent pointer

Describe the role of checksum field and option pad bytes.

(b) Answer the following:

- (i) Differentiate between the block cipher with transposition cipher.
- (ii) Using the RSA public key cryptosystem with  $a=1$ ,  $b=2$  etc.
  - (I) If  $p=7$  and  $q=11$ , list five legal values for  $d$ .
  - (II) If  $p=13$  and  $q=31$  and  $d=7$ , find  $e$ .

(c) Discuss:

- (i) Different steps of JPEG compression standard.
- (ii) The RPC design and implementation issues.

**5 ATTEMPT ANY TWO : (10×2=20)**

- (a) Explain the SMTP can handle transfer of videos and images? Also explain the advantages of IMAP 4 over POP 3 mail access protocols.
- (b) What is the difference between an active web document and dynamic web page? Also explain the role of CGI.
- (c)
  - (i) Compare and contrast TCP with RTP. Are both doing the same things?
  - (ii) What are the problems for full implementation of voice over IP? Did you think we will stop using the telephone network very soon?