Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Computer Networks – I

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions, selecting*
atleast TWO questions from each part.

PART – A

1 a. With a neat diagram, explain the functionalities of each layers of OSI – reference model.
   (10 Marks)
  b. Define networks what are the three criteria necessary for an effective and efficient network.
   (04 Marks)
  c. Differentiate between :
   i) TCP and UDP
   ii) Half duplex and full duplex
   iii) ICMP and IGMP.
   (06 Marks)

2 a. Discuss the three causes of transmission impairments. **(06 Marks)**
  b. Define line coding. Explain the characteristics of line coding. **(10 Marks)**
  c. Consider a channel with 1MHz bandwidth, the SNR for this channel is 63. What is appropriate bit rate and signal level? **(04 Marks)**

3 a. Explain how statistical TDM overcomes the disadvantages of synchronous TDM. **(04 Marks)**
  b. Discuss the three phases in virtual circuit network with suitable illustration. **(10 Marks)**
  c. Four sources create 250 characters per sec. The frame contains one-character from each source and one extra bit for synchronization find :
   i) Data rate of each sources
   ii) Duration of each character in each source
   iii) The frame rate
   iv) Duration of output frame
   v) Frame size in bits
   vi) Data rate of link. **(06 Marks)**

4 a. What are the different types of errors? Explain in brief. **(04 Marks)**
  b. What is block coding? Explain error detection, and error correction. **(09 Marks)**
  c. Find the codeword $c(x)$ for the transformation $d(x) = x^3 + 1$, with the generator polynomial $t(x) = x^3 + x + 1$. **(07 Marks)**

PART – B

5 a. Compare and contrast byte-oriented and bit-oriented protocols. **(06 Marks)**
  b. Explain briefly with a neat figures :
   i) Stop and wait protocol
   ii) Stop and wait ARQ protocol. **(08 Marks)**
  c. Describe the different transition phases in Point-to-Point Protocol(PPP). **(06 Marks)**

6 a. Write a note on :
   i) Slotted ALOHA
   ii) 802.3 MAC frame format. **(10 Marks)**
  b. What is channelization? Explain FDMA and TDMA protocols used for channelization.
(07 Marks)
  c. A pure ALOHA network transmits 200 bits frames on a shared channel of 200 kbps. What is the requirements to make this frame collision free. **(03 Marks)**

7 a. Explain the hidden and exposed station problem in IEEE 802.11 MAC layer. **(10 Marks)**
  b. Explain two different types of networks used in Bluetooth. **(06 Marks)**
  c. Calculate the maximum number of simultaneous calls in each cell in IS-136(D-AMPS) system. Assume there are no analog control channels. **(04 Marks)**

8 a. Find the class of each address :
   i) 00000001   00001011   00001011   11101111
   ii) 11000001   10000011   00011011   11111111
   iii) 14.23.120.8
   iv) 252.5.15.111. **(04 Marks)**
  b. Discuss the IPV_4 header format, with a neat diagram. **(10 Marks)**
  c. What are the advantages of IPV_6 over IPV_4? **(06 Marks)**

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