Code No: **R1632051** **R16** SET - 1

III B. Tech II Semester Regular/Supplementary Examinations, August-2021

COMPUTER NETWORKS

(Common to Computer Science and Engineering, Information Technology)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A **(14 Marks)**

1. a) List two advantages and two disadvantages of having international standards for network protocols. [2M]
   b) What signal-to-noise ratio is needed to put a T1 carrier on a 50-kHz line? [2M]
   c) Define piggybacking and its usefulness. [2M]
   d) How many frames per second can gigabit Ethernet handle? [3M]
   e) Is Virtual circuit same as Physical connection? Justify. [3M]
   f) Why does TCP use an adaptive retransmission? [2M]

PART –B **(56 Marks)**

2. a) Dialog control and synchronization are two responsibilities of the session layer in the OSI model. Which layer do you think is responsible for these duties in the Internet model? Explain. [7M]
   b) Suppose the algorithms used to implement the operations at layer *k* is changed. Explain how these impact operations at layers k−1 and k+1 do? [7M]

3. a) Ten signals, each requiring 4000 Hz, are multiplexed onto a single channel using FDM. What is the minimum bandwidth required for the multiplexed channel? Assume that the guard bands are 400 Hz wide. [7M]
   b) Sixteen-bit messages are transmitted using a Hamming code. How many check bits are needed to ensure that the receiver can detect and correct single-bit errors? Show the bit pattern transmitted for the message 1101001100110101. Assume that even parity is used in Hamming code. [7M]

4. a) Explain the reason for moving from the Stop-and-Wait ARQ protocol to the Go-Back-N ARQ protocol. [7M]
   b) A channel has a bit rate of 4 kbps and a propagation delay of 20 ms. For what range of frame sizes does stop-and-wait give an efficiency of at least 50%? [7M]

5. a) Discuss the MAC layer functions of IEEE 802.11. [7M]
   b) Explain about the Persistent and Non Persistent CSMA. [7M]

6. a) Describe the various approaches to congestion control. [7M]
   b) Explain the Hierarchical routing algorithm with an example. [7M]

7. a) Describe the TCP service model along with its protocols. [7M]
   b) Explain the architecture of Electronic mail with a neat sketch. [7M]

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