[This question paper contains 2 printed pages.]

Your Roll No.....

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Sr. No. of Question Paper	:	**2234**
Unique Paper Code	:	2342573601
Name of the Paper	:	Computer Networks
Name of the Course	:	**B.A./B.Sc. (Prog)**
Semester	:	VI

Duration : 3 Hours Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. **Section A** is compulsory.
3. Attempt **any 4** questions from **Section B**.
4. Parts of a question must be answered together.

Section A

1. a) Distinguish between IPv4 and IPv6 protocol. 4

   b) Assume that a voice channel occupies a bandwidth of 4 kHz. We need to multiplex 10 voice channels with guard bands of 500 Hz using FDM. Calculate the required bandwidth. 5

   c) What is the remainder obtained by dividing $x^7 + x^5 + 1$ by the generator polynomial $x^3 + 1$? Show the binary steps and the transmitted data. 5

   d) Frames of 1000 bits are sent over a 1 Mbps channel using a geostationary satellite whose propagation time from the earth is 270 msec. Acknowledgements are always piggybacked into data frames. The headers are very short. Three-bit sequence numbers are used. What is the maximum achievable channel utilization for: Stop-and-wait, Go-back-N and Selective repeat algorithms. 6

   e) Describe different parts of a URL. What is the role of HTTP protocol and at which layer does it work? What are the steps to be followed to fetch a web page from a server? 5

   f) Describe the responsibilities of physical layer in TCP/IP model? Which of the model among TCP/IP and OSI models is used on Internet these days? 5

Section B

2. a) Compare and contrast TCP and UDP (User Datagram Protocol) in terms of their features, advantages and disadvantages. Discuss scenarios where each protocol would be suitable for data transmission. 7

   b) Write short notes on: 8

   (i) File Transfer Protocol

   (ii) Simple Mail Transfer Protocol

P.T.O.

3. a) What do you understand by Multiplexing? Two channels, one with a bit rate of 190 kbps and another with bit rate of 180 kbps are to be multiplexed using pulse stuffing TDM with no synchronization bits. What is the size of the frame in bits? What is the frame size and data rate? 5

   b) (i) What is transmission impairment? Explain its types. 4+6
   (ii) Differentiate between wired and wireless media. Should we use optical fibre for data transmission?

4. a) Write a short note on the Internet Protocol (IP) that works at the network layer of the TCP/IP model. Discuss how packets are routed to the destination network. 5

   b) Suppose that a message 1100 1001 0011 1010 is transmitted using Internet Checksum (4-bit word). What is the value of the checksum? What kind of errors will not be detected by Checksum? 5

   c) Describe the job of a router and how it is different from switches? How is point to point connection different from a multipoint connection? Give an example of each. 5

5. a) Explain stop and wait protocol for noise free channels. What are the issues of stop and wait protocol? 6

   b) Differentiate the following: 9
   (i) Flow control and Error control
   (ii) HUB and Gateway
   (iii) Bus Topology and Mesh Topology

6. a) (i) Differentiate between LAN, MAN and WAN. 3+3
   (ii) Explain simplex data flow. How is it different from half duplex communication?

   b) A 12-bit odd-parity Hamming code whose binary value is 111001001111 arrives at the receiver. Find the original value of the message. Assume that not more than 1-bit is in the error. 4+5

7. a) Write any two network commands: 5
   (i) Netstat (ii) Ping (iii) Tracert

   b) Explain the layers in which following tasks are performed in the OSI reference model. 10
   (i) Physical addressing (iv) Session Management
   (ii) Logical addressing (v) Encryption/Decryption
   (iii) Routing