Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India
(Autonomous College Affiliated to University of Mumbai)

End Semester Examination
November 2020

Max. Marks: 60 Duration: 2 Hrs.
Class: T.E. Semester: V
Course Code:IT52 Branch: IT.
Name of the Course: Computer Networks

Instruction:
(1) All questions are compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

| **Q. No.** | | **Max. Marks** | **CO** |
|---|---|---|---|
| 1a) | Consider a 125 KB file that needs to be sent through a network path. The bandwidth of the path is 1 Mbps. How long does it take to send the file? What is throughput and delay and what is the relation between them? | 4 | 1 |
| 1b) | What does PDU stand for ? What does it indicate? List the PDU used at application, transport, network , and physical layer. | 3 | 1 |
| 1c) | Knowing the channel partitioning and random access protocols properties assume we have a shared link that connects 'N' nodes. Under what circumstances will we achieve higher performance using TDMA rather than CSMA/CD to resolve contention for the link? | 4 | 2 |
| 1d) | In a CSMA / CD network running at 10 Gbps over 10 km cable. Signal speed in the cable is 200000 km/sec. What is minimum frame size? | 4 | 2 |

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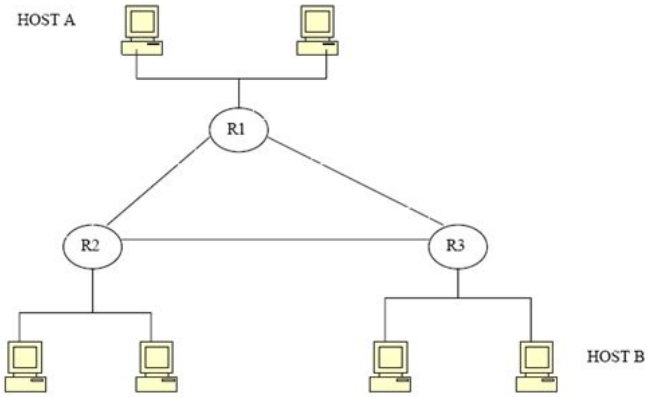
| 2a) |  <br>How many separate networks are in the system? Partition the given address space 220.23.16.0/24 and assign addresses to these networks. Write down the addresses of all of these networks in the CIDR A.B.C.D/x format. | 6 | 3 |
| 2b) | Host H1 wants to send a payload of 2000 bytes. The MTU of the network is 1492 bytes. List the total length, identification, more bit of the flags, fragment offset and payload fields for all fragments with proper justification. | 5 | 3 |
| 2c) | What is the issue in Distance Vector routing? Exemplify the TTL technique to solve that issue. | 4 | 3 |
| 3a) | Host A sends two TCP segments to host B back to back over a TCP connection. The first segment has sequence number 90 and the second segment has sequence number 110. How much data is in the first segment?<br>Suppose that the first segment is lost but the second segment arrives at B. In the acknowledgment that Host B sends to Host A, what will be the acknowledgment number? Show this scenario with the neat diagram. | 4 | 4 |
| 3b) | TCP congestion control scenario: In the transmission round 1, MSS=1 segment. Slow start threshold=8MSS. Timeout occurs at round 8. What will be the MSS at $9^{th}$ round and $15^{th}$ round. If 3 dup ACK received at round 8 then show the congestion window at $15^{th}$ round with neat diagram along with valid justification | 6 | 4 |
| 3c) | What does UDP stand for? It works on which layer in TCP/IP and OSI model? How error is detected at the receiver when data is sent using UDP ? UDP is connection oriented or connection less protocol and does it provide reliability?Why UDP is needed? | 5 | 4 |

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| 4a) | A receiver receives the Hamming code 11110101101 (with even parity). Identify the bit if there is any error (show the steps to justify your result). What is the correct data sent? | 5 | 2 |
| 4b) | The HDLC frame is sent from a primary to a secondary. Answer the following questions:<br>a. What is the address of the secondary?<br>b. What is the type of frame?<br>c. What is the sender sequence number(if present)?<br>d. What is the acknowledgement number (if present)?<br>e. Does the frame carry user data?If yes, what is the value of the data?<br>f. Does the frame carry management data?If yes, what is the value of the data?<br>g.What is the purpose of this frame?<br><br>01111110 00000111 10101011 FCS 01111110 | 5 | 2 |
| 4c) | Write a short note on (Any one)<br>i.Advantages of optical fiber over twisted-pair and coaxial cable.<br>ii.Telnet and justify the use of NVT in remote login. | 5 | 1 |

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