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**Question Paper Code : X 10320**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020 AND  
APRIL/MAY 2021

Fifth/Sixth Semester

Computer Science and Engineering  
CS 8591 – COMPUTER NETWORKS

(Common to : Computer and Communication Engineering/Information Technology)  
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. How are the subgroups of OSI model layers segregated by their functions ?
2. Differentiate Circuit-switched networks and Packet-switched networks.
3. List out the functions of the Data Link Layer.
4. Find the Hamming distance between two pair of code words :  
A = 01011  
B = 11110
5. Why IPv6 is preferred over IPv4 ?
6. Find the class of each address.  
a) 11000001 10000011 00011011 11111111  
b) 252.5.15.111
7. How congestion occurs in a network ?
8. What happens in the three way handshaking between any two devices ?
9. Define anonymous FTP.
10. What is the difference between IMAP and POP ?



PART – B

**(5×13=65 Marks)**

11. a) i) What are the layers of the ISO/OSI protocol stack ? Briefly list out their functions. **(10)**
- ii) What is the need for another checking mechanism at the transport layer even though the data link layer is capable of detecting the errors between the hops ? **(3)**
- (OR)
- b) i) Compare and contrast guided and unguided media for transmission. **(7)**
- ii) One channel with a bit rate of 190 kbps and another with a bit rate of 180 kbps are to be multiplexed using TDM with no synchronization bits.
- 1) What is the size of a frame in bits ? **(3)**
- 2) What is the data rate ? **(3)**
12. a) i) A message that is to be transmitted is represented by the polynomial  $M(x) = x^5 + x^4 + x$  with a generating prime polynomial  $G(x) = x^3 + x^2 + 1$ . Generate a 3 bit CRC code,  $C(x)$  which is to be appended to  $M(x)$ . **(10)**
- ii) How is a hub related to a repeater ? **(3)**
- (OR)
- b) Explain in detail about the error and flow control mechanisms employed at data link layer. **(13)**
13. a) What are the different routing algorithms ? List out their pros and cons. **(13)**
- (OR)
- b) An ISP is given a block of addresses beginning with 190.100.0.0/16. The ISP needs to distribute these addresses to 3 groups of customers as follows :
- a) Group 1 has 64 customers each needs 256 addresses. **(3)**
- b) Group 2 has 128 customers each needs 128 addresses. **(3)**
- c) Group 3 has 128 customers each needs 64 addresses. **(3)**
- Design the sub-blocks and give the slash notation for each sub-block. How many addresses are still available after these allocations ? **(4)**
14. a) What are the two broad categories of Congestion Control mechanisms ? Briefly explain all the techniques. **(13)**
- (OR)
- b) Furnish the packet format of Stream Control Transmission Protocol with its fields. How are the data transferred with four way handshaking ? **(13)**



15. a) What is the format of an email ? Explain the architecture of a mailing system. **(13)**

(OR)

b) Does the SSL protocol need the services of a Certificate Authority ? Explain your answer. **(13)**

PART – C

**(1×15=15 Marks)**

16. a) i) Explain the process of web page loading of the given page :

<http://www.annauniv.edu/ug/cse/index.html>

Assume the IP address is unknown, HTTP 1.1 is used, web page is available. **(7)**

ii) How a stateful session on a shopping cart application at flipkart.com can be implemented by a stateless HTTP ? What will be the security vulnerability in this approach ? **(8)**

(OR)

b) Two hosts are in a CSMA/CD network and the medium has a data transfer capacity of 1Gbps. The minimum frame length is fixed to 1,000 bits and the propagation speed is  $2 \times 10^8$  m/s.

i) What will be the distance between the hosts ? **(7)**

ii) If it is an Ethernet network, what is the efficiency when the hosts have a maximum distance between them ? If the distance is reduced to 1 m, does it impact the efficiency ? **(8)**

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