Reg. No.															

B.Tech. DEGREE EXAMINATION, DECEMBER 2023

Fourth Semester

18CSS202J – COMPUTER COMMUNICATIONS

(For the candidates admitted from the academic year 2020-2021 & 2021-2022)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours

Max. Marks: 100

PART – A (20 × 1 = 20 Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. _____ type of topology is best suited for large businesses to carefully control and coordinate the operation of distributed branch outlets. (A) Ring (B) Local area (C) Hierarchical (D) Star	1	1	1	1
2. A local telephone network is an example of a _____ network. (A) Packet switched (B) Message switched (C) Circuit switched (D) Virtual switched	1	1	1	1
3. A _____ network is a cross between a circuit switched network and a datagram network that it has some common characteristics. (A) Packet switched (B) Frame switched (C) Virtual circuit (D) Line switched	1	1	1	1
4. _____ layer user data compression to reduce the number of bits to be transmitted. (A) Presentation (B) Network (C) Data link (D) Application	1	1	1	1
5. A _____WAN can be developed by using any other transmission facility. (A) Multi-Peer (B) Peer-Peer (C) Two-Tiered (D) Hybrids	1	1	1	1
6. An IPv4 address is a 32-bit address that _____ and _____ defines the connection of device. (A) Uniquely and universally (B) Uniquely (C) Universally (D) Divide and combine	1	2	2	2
7. Find the error, if any in the following IPv4 addresses (i) 111.56.045.78 (ii) 221.34.7.8.20 (ii) 75.45.301.14 (iv) 1100010.23.14.67 (A) All the 4 cases errors (B) (i), (ii) and (iii) errors (C) (ii), (iii) and (iv) error (D) All the 4 cases correct	1	2	2	2
8. Which of the following network devices stores the IP addresses? (A) Router (B) Switch (C) Repeater (D) Both (A) and (B)	1	1	1	1

9. A group of computers and other devices connected together is called a network and the concept of connected computers sharing resources is called _____. 1 1 1 1

(A) Networking (B) Inter-network
(C) Inter-connection (D) Computer group

10. The _____ elements are specialized computers to connect two or more transmission lines. 1 1 1 1

(A) Networking (B) Broadcasting
(C) Switching (D) Transferring

11. Your router has the following IP address on Ethernet 172.16.2.1/23. Which of the following can be valid host Ids on the LAN interface attached to router? 1 2 2 2

(A) 172.16.1.100 (B) 172.16.1.198
(C) 172.16.2.255 (D) 172.16.1.255

12. You need to subnet a network that has 5 subnets, each with atleast 16 hosts. Which classful subnet mas would you use? 1 2 2 2

(A) 255.255.255.192 (B) 255.255.255.224
(C) 255.255.255.240 (D) 255.255.255.248

13. The combination of _____ and _____ is often termed as the local address of the local portion of the IP address. 1 2 2 2

(A) Network number and host number (B) Network number and subnet number
(C) Subnet number and host number (D) Host number

14. The network address of 172.16.0.0/19 provides _____ subnets and _____ hosts? 1 2 2 2

(A) 7 subnets 30 hosts each (B) 8 subnets 8190 hosts each
(C) 8 subnets 2046 hosts each (D) 7 subnets 2046 hosts each

15. Change the following IPv4 decimal notation. 1 2 2 2

10000001 000010111 00001011 11101111

(A) 193.131.27.255 (B) 129.11.11.239
(C) 128.10.10.238 (D) 194.131.28.256

16. _____ cable can carry signals of higher frequency ranges than _____ cable. 1 3 3 3

(A) Coaxial, twisted-pair (B) Twisted pair, fiber-optic
(C) Co-axial, fiber optic (D) Fiber optic alone

17. IP address belonging to class C are assigned to small-sized networks. The network ID is _____ bit long and the host ID is _____ bit long. 1 2 2 2

(A) 8, 24 bits (B) 16, 16 bits
(C) 12, 12 bits (D) 24, 8 bits

18. Each block is class A contains addresses _____. 1 2 2 2

(A) 2^{16} (B) 2^{24}
(C) 2^{8} (D) 2^{14}

19.	Default mask for class B addressing is _____. (A) 255.0.0.0 (B) 255.255.255.0 (C) 255.255.0.0 (D) 255.255.0.255	1	2	2	2
20.	What is the major factor that makes coaxial cable less susceptible to noise than twisted pair cable? (A) Insulating material (B) Inner conductor (C) Diameter of cable (D) Outer conductor	1	3	3	3

PART – B (5 × 4 = 20 Marks)
Answer **ANY FIVE** Questions

		Marks	BL	CO	PO
21.	Differentiate various transmission modes.	4	2	1	1
22.	Assume a system uses five protocol layers. If the applications program creates a message of 100 bytes and each layer (including the fifth and first) adds a header of 10 bytes to the data unit, what is the efficiency (the ratio of application layer bytes to the number of bytes transmitted) of the system?	4	3	1	2
23.	A block of addresses is granted to a small organization. We know that one of the address is 205.16.37.39/28. What is the first address in the block?	4	2	2	2
24.	Mention the types of hubs and drawback of hubs.	4	2	2	2
25.	Mention the steps involved to digitize an analog signal in pulse code modulation.	4	3	3	3
26.	Obtain the 4 bit CRC code word for the data bit sequence 10011011100 (left most bit is the least significant) using the generator polynomial given by $x^4 + x^2 + 1$. Explain the answer with problem solving method	4	4	4	1
27.	Draw the diagram for 3-node instability problem in distance vector routing.	4	5	5	5

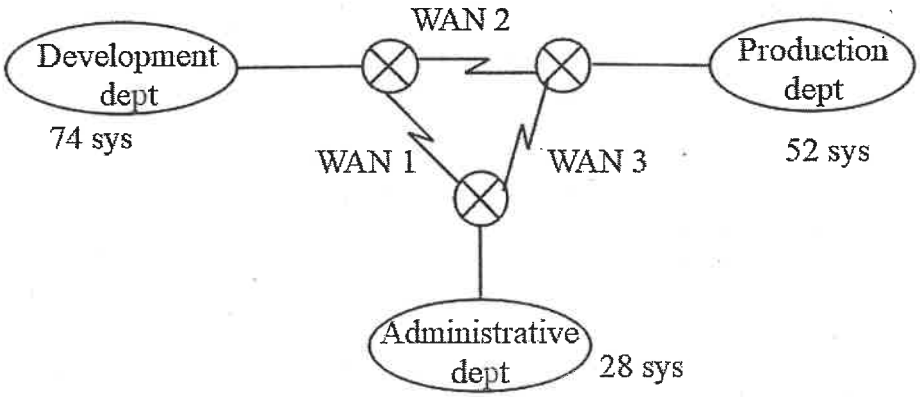
PART – C (5 × 12 = 60 Marks)
Answer **ALL** Questions

		Marks	BL	CO	PO
28. a.	Draw the architecture of OSI model and explain the functionalities of each layer. Also discuss how it differs from the TCP/IP layered architecture.	12	2	1	1
	(OR)				
b.i.	Using stop and wait protocol, the sender wants to transmit 10 data packets to the receiver. Out of these 10 data packets, every 4th data packet is lost. How many packets sender will have to send in total? Draw the timeline diagram and find the lost packets?	8	3	1	1
ii.	Explain virtual circuit networks with an example.	4	3	1	2
29. a.	An organization is grated with the IP address 192.16.2.0/24. The administrator wants to create 4 subnets. Calculate the following (i) Find the subnet mask (ii) Number of hosts in each subnet (iii) First and last host address of each subnet (iv) Network and broadcast address of each subnet	12	2	2	2
	(OR)				

b. Assume you are network administrator of a software company. The company has 3 departments connected via WAN link granted with 192.16.1.0. 12 2 2 2

- Development department has 74 systems
- Production department has 52 systems
- Administrative department has 28 systems

All departments are connected with each other via WAN link. Each WAN link required to IP addresses.



30. a. Define multiplexing. Explain briefly about 3 types with suitable diagram. 12 3 3 3

(OR)

b. Explain in detail about guided and unguided transmission media. 12 3 3 3

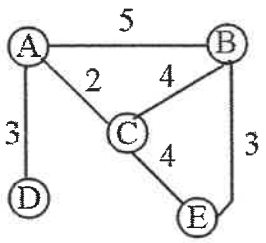
31. a.i. Consider a message 111010 which is represented by the polynomial $M(x) = x^5 + x^4 + x^3 + x$ and the generator polynomial $G(x) = x^3 + x^2 + 1$. Calculate the CRC. 6 4 4 4

ii. Calculate redundancy bits for the following data frames. 6 4 4 4
Data: 10011010

(OR)

b. Explain briefly about Goback N ARQ and selective reject ARQ in a detailed Manner. 12 4 4 4

32. a. Define the suitable link state routing process for the below diagram to find optimal path. 12 5 5 3



(OR)

b. Explain in detail about OSPF routing protocols along with the working principles. 12 5 5 5

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