SRM Institute of Science and Technology
College of Engineering and Technology
School of Computing

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

SET-B

Academic Year: EVEN-2022-23

Test: CLA-T2 **Date: 30/03/2023**
Course Code & Title: 18CSS202J-Computer Communications **Duration: 2 Hours**
Year & Sem: II Yr / IV Sem **Max. Marks: 50**

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	3
CO2	3	2	3	-	-	-	-	-	-	-	-	3
CO3	3	3	3	-	-	-	-	-	-	-	-	3
CO4	3	2	-	-	-	-	-	-	-	-	-	3
CO5	3	-	-	-	-	-	-	-	-	-	-	3
CO6	3	3	3	-	-	-	-	-	-	-	-	3

Part – A (10 x 1 = 10 Marks)

Instructions: 1) Answer ALL questions. 2) The duration for answering the part A is 15 minutes (this sheet will be collected after 20 minutes). 3) Encircle the correct answer (if more than one is right answer encircle appropriately)

Q. No	Question	Marks	BL	CO	PO	PI Code
1	The number of addresses assigned to an organization in classless addressing a) can be any number b) must be a multiple of 256 **c) must be power of 2** d) must be power of 4	1	2	3	1	1.6.1
2	Select the field that is used to specify how long an IP packet can reside in-network before it is finished? a) Identification b) Options c) TOS d) **Time to live**	1	1	3	1	1.6.1
3	Classless Addressing overcomes the problem of a) address completion **b) address depletion** c) address extraction d) Address Addition	1	1	3	1	1.6.1
4	The TTL field has value 10. How many routers (max) can process this datagram? a) 11 b) 5 **c) 10** d) 1	1	2	2	2	2.6.3

5	In an IPv6 header, the traffic class field is similar to which field in the IPv4 header? a) Fragmentation field b) Fast switching **c) TOS field** d) Option field	**1**	**1**	**3**	**1**	**1.6.1**
6	The FDMA channel carries _____ phone circuit at a time. **a) One** b) Two c) Three d) Four	**1**	**1**	**2**	**1**	**1.6.1**
7	NRZ-L and NRZ-I both have an average signal rate of _____ a) f/N **b) N/2** c) N d) (½)V^2	**1**	**2**	**2**	**2**	**2.6.3**
8	Delta modulation uses _____ bits per sample. **a) One** b) Two c) Four d) Eight	**1**	**1**	**2**	**1**	**1.6.1**
9	Calculate the baud rate of ASK signal having a bit rate of 400 bps a) 800 baud/s b) 300 baud/s c) **400 baud/s** d) 200 baud/s	**1**	**2**	**2**	**1**	**2.6.3**
10	T-1 and ISDN telephone lines are common examples of a) **Synchronous time division multiplexing** b) Statistical time division multiplexing c) Course wavelength division multiplexing d) Dense wavelength division multiplexing	**1**	**1**	**2**	**1**	**1.6.1**

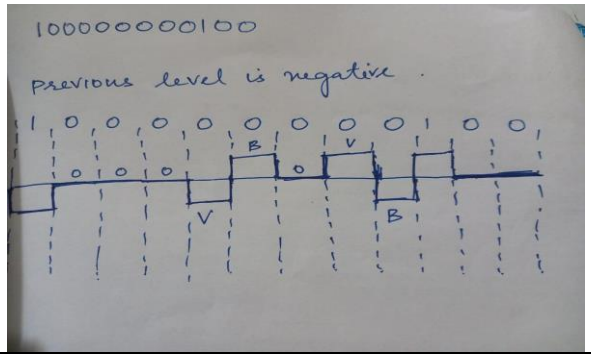
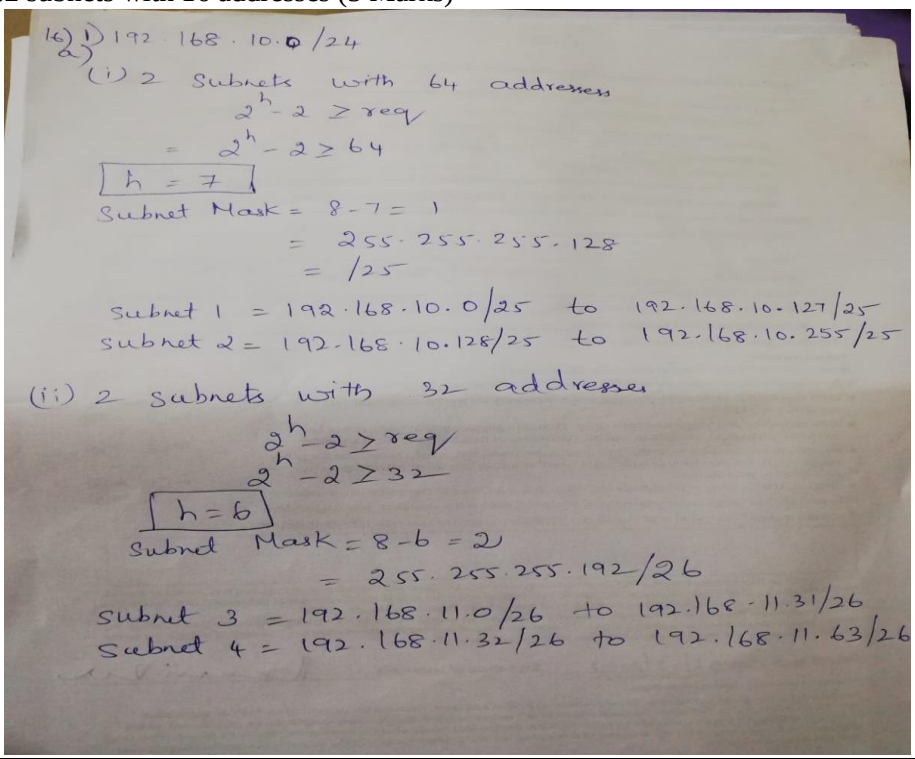
Part – B (5 x 2 Marks =10 Marks)

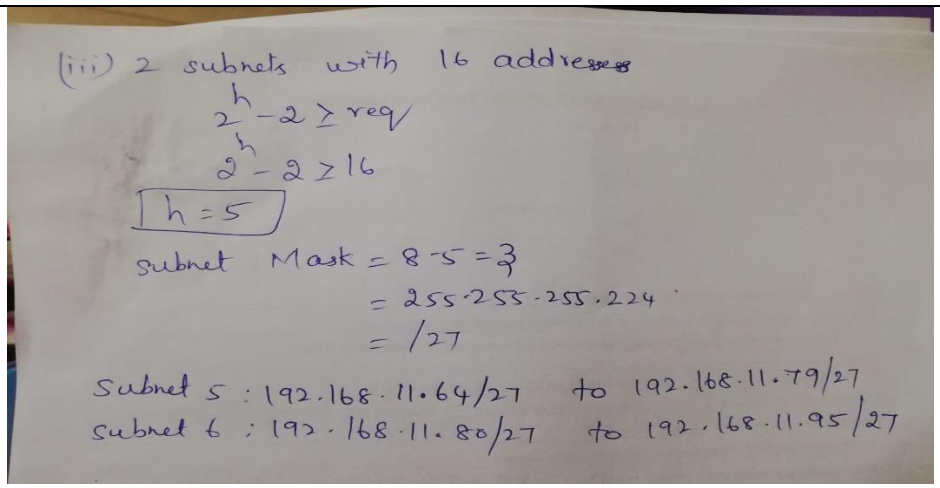
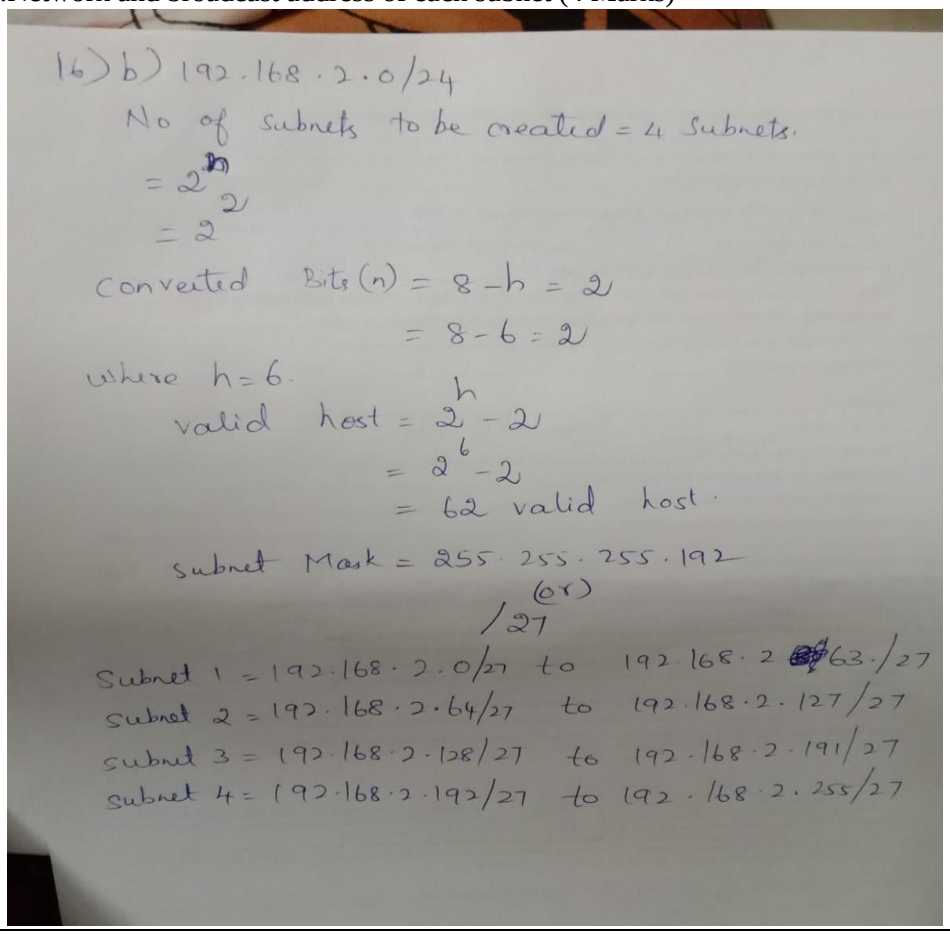
11	Differentiate IPV4 and IPV6 Addressing.	**2**	**3**	**3**	**2**	**2.6.4**

Basis for differences	**IPv4**	**IPv6**
Routing Information Protocol (RIP)	RIP is a routing protocol supported by the routed daemon.	RIP does not support IPv6. It uses static routes.
Address Mask	Use for the designated network from host portion.	Not used.
Security	Security is dependent on applications - IPv4 was not designed with security in mind.	IPSec(Internet Protocol Security) is built into the IPv6 protocol, usable with a proper key infrastructure.
Packet size	Packet size 576 bytes required, fragmentation optional	1208 bytes required without fragmentation
Basis for differences	IPv4	IPv6
Routing Information Protocol (RIP)	RIP is a routing protocol supported by the routed daemon.	RIP does not support IPv6. It uses static routes.
Best feature	Widespread use of NAT (Network address translation) devices which allows single NAT address can mask thousands of non-routable addresses, making end-to-end integrity achievable.	It allows direct addressing because of vast address Space.
Address Mask	Use for the designated network from host portion.	Not used.
Packet size	Packet size 576 bytes required, fragmentation optional	1208 bytes required without fragmentation

Any 4 points (2 marks)

12	Find the class of each address. i.00000001 00001011 00001011 11101111 – **Class A** i.11000001 10000011 00011011 11111111 – **Class C**	**2**	**3**	**3**	**2**	**2.6.3**
13	A block of addresses is granted to a small organization. We know that one of the addresses is 205.16.37.39/28. What is the first address in the block? **The binary representation of the given address is 11001101 00010000 00100101 00100111** **If we set 32−28 rightmost bits to 0, we get 11001101 00010000 00100101 0010000**	**2**	**2**	**3**	**1**	**1.6.1**

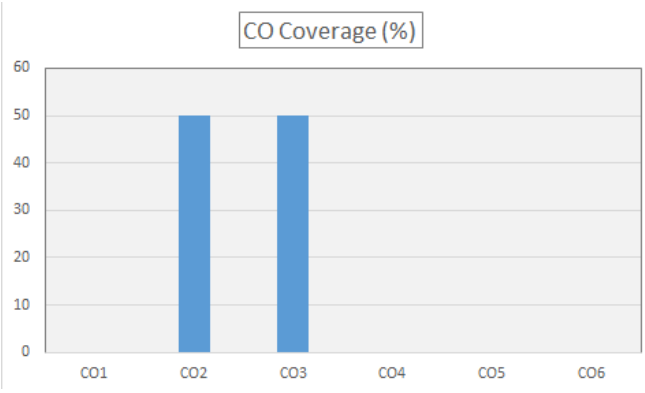
	or **205.16.37.32**					
14	Illustrate B8ZS scrambling technique for the data sequence 100000000100 if the previous level is negative. 	**2**	**3**	**2**	**2**	**2.6.3**
15	When do you prefer TDM to FDM? i)The signals are digital (ii) For long distance communication with low interference.	**2**	**3**	**2**	**1**	**1.6.1**
	Part – C (2 X 15 = 30 Marks)					
16)a)	An organization is granted with an IP Address 192.168.10.0/24. The network administrator wants to create subnets as follows and find the subnet mask, network address, broadcast address, host range for each subnet. i.2 subnets with 64 addresses (5 Marks) i.2 subnets with 32 addresses (5 Marks) i.2 subnets with 16 addresses (5 Marks) 	**15**	**3**	**3**	**2**	**2.6.3**

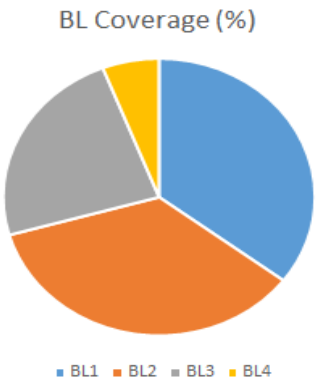
						
	(OR)					
16)b)	An organization is granted with the IP Address 192.16.2.0/24. The administrator wants to create 4 subnets. Calculate the following: **i.**Find the subnet mask (4 Marks) **i.**Number of hosts in each subnet (3 Marks) **i.**First and last host address of each subnet (4 Marks) **v.**Network and broadcast address of each subnet (4 Marks) 	**15**	**3**	**3**	**3**	**3.2.1**

17)a)	I. Formulate the bandwidth requirement of different digital modulation techniques. (5 Marks) The bandwidth B of ASK is proportional to the signal rate S. **B = (1+d)S** "d" is depends on modulation and filtering process, "d" value lies between 0 and 1. If the difference between the two frequencies (f_1 and f_2) is $2\otimes f$, then the required BW B will be: **B = (1+d)xS +2⊗f** The bandwidth requirement, B is: ***B = (1+d)xS*** The minimum bandwidth required for QAM transmission is the same as that required for ASK and PSK transmission. II. Demonstrate how frequency division multiplexing is used to allow multiple users to share a single physical communications medium and discuss its advantages and limitations. (10 Marks) Frequency division multiplexing technique along with block diagram (6 marks) Advantages and limitations (4 marks)	**15**	**4**	**2**	**2**	**2.6.3**
	(OR)					
17)b)	I. Choose appropriate bipolar encoding techniques for the following data sequence (12 Marks) i.01101101 i.110000000010 i.10000110010000 i) Encode the sequence using AMI (4 marks) ii) Encode the sequence using B8ZS (4 marks) iii) Encode the sequence using HDB3 (4 marks) II. Find the bandwidth for a signal transmitting at 26 Mbps for QPSK. The value of d = 1. (3 Marks) For QPSK, 2 bits is carried by one signal element. This means that r = 2. So the signal rate (baud rate) is S = N × (1/r) = 13 Mbaud. With a value of d = 1, we have B = (1+1) S = 26 MHz.	**15**	**4**	**2**	**3**	**3.2.1**

***Performance Indicators are available separately for Computer Science and Engineering in AICTE examination reforms policy.**

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Audit Professor/Course Coordinator