Register Number															

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

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Academic Year: 2021-22 (Even)

Set - C

Test: CLA-T2 | Date: 30-05-2022
Course Code & Title: 18CSS202J - Computer Communications | Duration: 100 Minutes (2 Periods)
Year & Sem: II Year / IV Sem | Max. Marks: 50

Course Articulation Matrix:

S.No.	Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
1	CO1	3	-	-	-	-	-	-	-	-	-	-	3
2	CO2	3	2	3	-	-	-	-	-	-	-	-	3
3	CO3	3	3	3	-	-	-	-	-	-	-	-	3
4	CO4	3	2	-	-	-	-	-	-	-	-	-	3
5	CO5	3	-	-	-	-	-	-	-	-	-	-	2
6	CO6	3	3	3	-	-	-	-	-	-	-	-	3

Part - A
(20 x 1 = 20 Marks)

Instructions: 1) Answer ALL questions. 2) The duration for answering the part A is 30 minutes (this sheet will be collected after 30 minutes). 3) Encircle the correct answer 4) * denotes more than one choice may be correct

Q. No	Question	Marks	BL	CO	PO	PI Code
1	In IPV4 address, Class C uses _____ bits for net ID and _____ bits for host ID a) 8, 24 b) 16, 16 c) 15, 17 **d) 24, 8**	1	1	3	1	1.7.1
2	How many possible networks are there in a class B of an IPv4 address? **a) 16384** b) 128 c) 256 d) 65536	1	1	3	2	2.6.3
3	Choose the dotted-decimal notation of the IPv4 address 11000011 01101001 10100010 01001011 **a) 195.105.162.75** b) 195.104.162.74 c) 194.104.161.74 d) 196.106.163.76	1	2	3	2	2.6.3
4	Choose the class of the given IPV4 address 92.168.192.92 **a) A** b) B c) C d) D	1	1	3	1	1.7.1
5	A block of addresses is granted to a small organization. One of the addresses is 192.168.100.105/27. What is the last address in the block? a) 192.168.100.0 b) 192.168.100.128 c) 192.168.100.126 **d) 192.168.100.127**	1	2	3	2	2.6.3
6	The network address of 172.16.0.0/19 provides how many subnets and hosts? a) 8 subnets, 4096 host each **b) 8 subnets, 8190 host each** c) 7 subnets, 30 host each d) 8 subnets, 2046 host each	1	2	3	2	2.6.3

7	The address space 225.225.225.225/32 is called as _____. a) Multicast Addresses b) loopback address **c) limited broadcast address** d) first address	1	1	3	1	1.7.1
8 *	Bridge operates at layer (s) _____of the OSI model. **a) Physical Layer** **b) Data link Layer** c) Network Layer d) Presentation Layer	1	2	3	1	1.7.1
9	A multiport bridge can be used to connect more than _____ LANs. a) one **b) two** c) four d) three	1	1	3	1	1.7.1
10	A _____ is a technology that allows a private network to use a set of private addresses for internal communication and a set of global Internet addresses for external communication. a) Address Aggregation b) Network address transfer **c) Network address translation** d) Slash notation	1	1	3	1	1.7.1
11	Bipolar coding is the process of converting _____. a) analog data to digital signals b) digital data to analog signals **c) digital data to digital signals** d) analog data to analog signals	1	1	4	1	1.7.1
12	When the voltage level remains constant for long periods of time, there is an increase in the low frequencies of the signal is called as _____. **a) DC components** b) Self synchronization c) Noise d) Baseline wandering	1	1	4	1	1.7.1
13	The _____ specifies how many data elements are sent in one second. a) signal rate **b) bit rate** c) frame rate d) message rate	1	1	4	1	1.7.1
14	In Phase Shift Keying, the _____ is varied represent two or more different signal elements and _____ remain constant as the phase changes. **a) carrier, frequency** b) voltage, frequency c) signal element, data element d) amplitude, frequency	1	1	4	1	1.7.1
15	Calculate the value of the signal rate for the case "Two data elements per one signal element" if the data rate is 1 Mbps and c = 1/2. a) 500 Kbaud b) 1 Mbaud **c) 250 Kbaud** d) 375 Kbaud	1	3	4	2	2.6.3
16	Which multiplexing technique transmits digital signals? **a) TDM** b) FDM c) WDM d) SDM	1	1	4	1	1.7.1
17	In synchronous TDM, a _____ is a complete cycle of time slots, including one or more slots dedicated to each sending device. a) filter b) carrier c) signal **d) frame**	1	1	4	1	1.7.1
18	FDM uses ___ to prevent modulated signals from overlapping a) Physical hardware devices b) carrier frequencies **c) guard bands** d) demultiplexers	1	1	4	1	1.7.1
19	The Bipolar Return to Zero scheme uses _____ voltage values. a) 1 b) 2 **c) 3** d) 4	1	1	4	1	1.7.1
20	The _____ digital signal is superior to _____ analog signal because it is more robust to noise and can easily be recovered, corrected and amplified a) Analog, Digital **b) Digital, Analog** c) Carrier, Data d) Data, Data	1	1	4	1	1.7.1

Register Number															

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

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamil Nadu

Academic Year: 2021-22 (Even)

Set - C

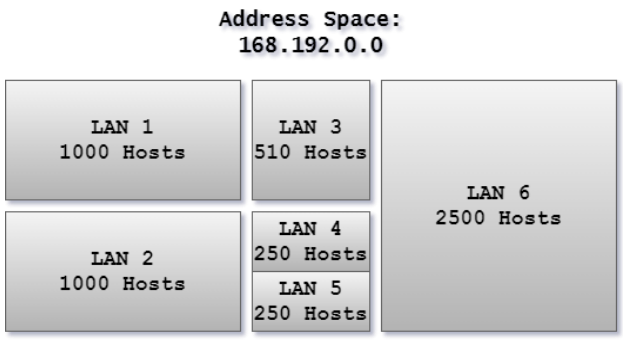
Test: CLA-T2 | Date: 30-05-2022
Course Code & Title: 18CSS202J - Computer Communications | Duration: 100 Minutes (2 Periods)
Year & Sem: II Year / IV Sem | Max. Marks: 50

Part – B
(2 x 5 = 10 Marks)
Instructions: Answer ALL questions

Q. No	Question	Marks	BL	CO	PO	PI Code
21	i. Identify the network Id for the IP address 200.1.1.50/28 ii. If 4 subnets are needed for 172.16.0.0 address space, what subnet mask must be assigned? iii. What is the significance of 0.0.0.0 and 255.255.255.255 iv. At least, how many network bits are used when the IP addresses 192.168.10.31 and 192.168.10.32 belong to different subnets? v. What is the wildcard mask for 255.255.255.128 **Answer:** i. 200.1.1.48 ii. 255.255.192.0 iii. Default network and Broadcast address iv. 27 v. 0.0.0.127	5	3	3	2	2.6.3
22	Define baseline wandering and its effect on digital transmission. **Answer:** ✓ In decoding a digital signal, the receiver calculates a running average of the received signal power. ✓ This average is called the baseline. ✓ The incoming signal power is evaluated against this baseline to determine the value of the data element. ✓ A long string of 0s or 1s can cause a drift in the baseline (baseline wandering) and make it difficult for the receiver to decode correctly. ✓ A good line coding scheme needs to prevent baseline wandering.	5	2	4	1	1.7.1

Part – C
(2 x 10 = 20 Marks)
Instructions: Answer ANY two questions

Q. No	Question	Marks	BL	CO	PO	PI Code
23. A	Resolve and tabulate:	10	3	3	2	2.6.3



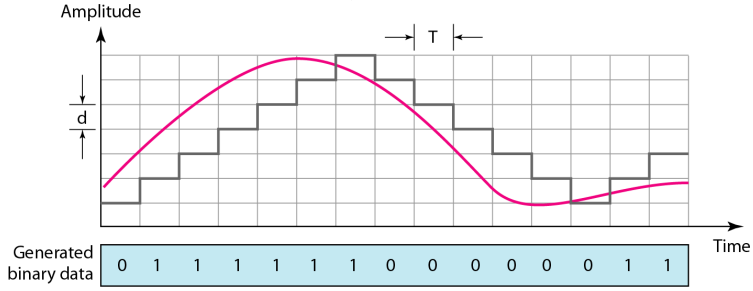
Network	Hosts	Net ID in CIDR notation	Subnet Mask	Number of Hosts in Subnet	Broadcast Address
LAN 1					
LAN 2					
LAN 3					
LAN 4					
LAN 5					
LAN 6					

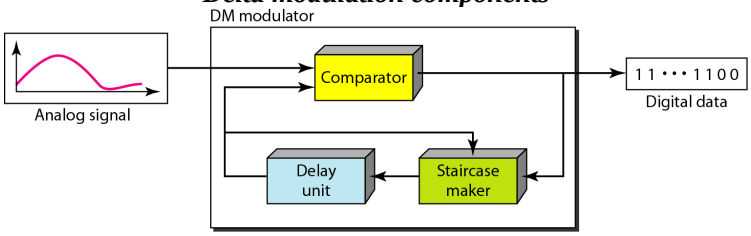
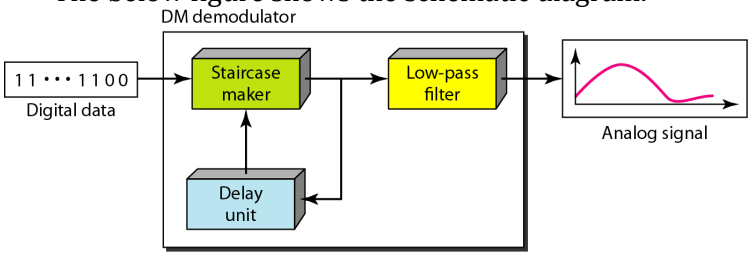
Answer:

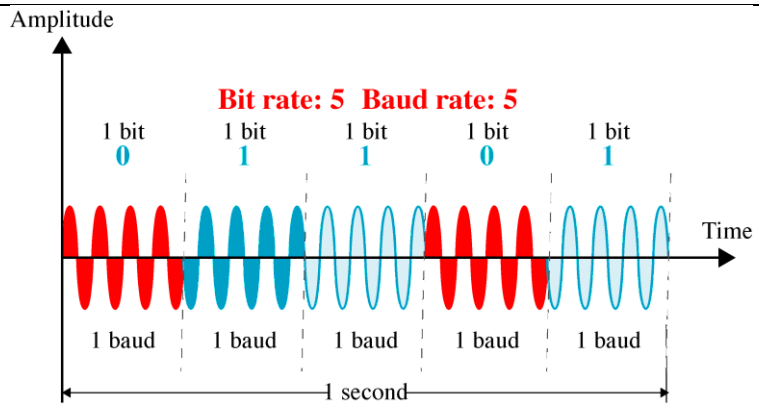
Network	Hosts	Net ID in CIDR notation	Subnet Mask	Number of Hosts in Subnet	Broadcast Address
LAN 6	2500	168.192.0.0/20	255.255.240.0	4094	168.192.15.255
LAN 1	1000	168.192.16.0/21	255.255.252.0	1022	168.192.19.255
LAN 2	1000	168.192.20.0/21	255.255.252.0	1022	168.192.23.255
LAN 3	510	168.192.24.0/23	255.255.254.0	510	168.192.25.255
LAN 4	250	168.192.26.0/24	255.255.255.0	254	168.192.26.255
LAN 5	250	168.192.27.0/24	255.255.255.0	254	168.192.27.255

Or

23. B	An organization is granted a block of 192.168.0.0. The administrator wants to create 17 subnets as shown below. 1. 4 subnets with 32 addresses 2. 5 subnets with 16 addresses 3. 4 subnets with 8 addresses 4. 4 subnets with 4 addresses Find the subnet mask, usable address range, network address, and broadcast address for each subnet. (7) If no subnetting is done and when Class C address is used for each network for the above demands, tabulate how many address spaces are **wasted** for each network. (3) **Answer:** 4 subnets with 32 addresses: 192.168.0.0/27, 192.168.0.32/27, 192.168.0.64/27 and 192.168.0.96/27	10	3	3	2	2.6.3

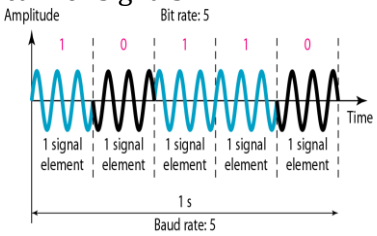
	5 subnets with 16 addresses: 192.168.0.128/28, 192.168.0.144/28, 192.168.0.160/28, 192.168.0.176/28, 192.168.0.192/28 4 subnets with 8 addresses: 192.168.0.208/29, 192.168.0.216/29, 192.168.10.224/29, 192.168.0.232/29 4 subnets with 4 addresses: 192.168.0.240/30, 192.168.0.244/30, 192.168.0.248/30 and 192.168.0.252/30 Wasted Addresses: Network | Required Hosts | Wasted Address Subnet 1 | 32 | 224 addresses Subnet 2 | 32 | 224 addresses Subnet 3 | 32 | 224 addresses Subnet 4 | 32 | 224 addresses Subnet 5 | 16 | 240 addresses Subnet 6 | 16 | 240 addresses Subnet 7 | 16 | 240 addresses Subnet 8 | 16 | 240 addresses Subnet 9 | 16 | 240 addresses Subnet 10 | 8 | 248 addresses Subnet 11 | 8 | 248 addresses Subnet 12 | 8 | 248 addresses Subnet 13 | 8 | 248 addresses Subnet 14 | 4 | 252 addresses Subnet 15 | 4 | 252 addresses Subnet 16 | 4 | 252 addresses Subnet 17 | 4 | 252 addresses					
24. A	Draw a diagram to depict the Delta Modulation and describe. **Answer:** ✓ The simplest is delta modulation. PCM finds the value of the signal amplitude for each sample; DM finds the change from the previous sample. ✓ The below figure shows the process. Note that there are no code words here; bits are sent one after another.  ✓ This scheme sends only the difference between pulses, if the pulse at time tn+1 is higher in amplitude value than the pulse at time tn, then a single bit, say a “1”, is used to indicate the positive value. ✓ If the pulse is lower in value, resulting in a negative value, a “0” is used. ✓ This scheme works well for small changes in signal values between samples.	10	2	4	1	1.7.1

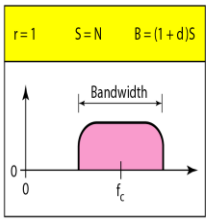
	✓ If changes in amplitude are large, this will result in large errors *Modulator* ✓ The modulator is used at the sender site to create a stream of bits from an analog signal. ✓ The process records the small positive or negative changes, called delta **δ**. If the delta is positive, the process records a 1; if it is negative, the process records a 0. ✓ However, the process needs a base against which the analog signal is compared. ✓ The modulator builds a second signal that resembles a staircase. ✓ Finding the change is then reduced to comparing the input signal with the gradually made staircase signal. ✓ Below figure shows a diagram of the process. ***Delta modulation components***  ***Demodulator*** ✓ The demodulator takes the digital data and, using the staircase maker and the delay unit, creates the analog signal. ✓ The created analog signal, however, needs to pass through a low-pass filter for smoothing. ✓ The below figure shows the schematic diagram. 					
	O r					
24. B	Explain phase shift keying with an applicable example. **Answer:** ✓ In PSK, the phase of the carrier is varied to represent two or more different signal elements. ✓ Both peak amplitude and frequency remain constant as the phase changes. ✓ Today, PSK is more common than ASK or FSK ✓ We vary the phase shift of the carrier signal to represent digital data. ✓ The bandwidth requirement, B is: ***B = (1+d) x S*** ✓ PSK is much more robust than ASK as it is not that vulnerable to noise, which changes amplitude of the signal.	10	2	4	1	1.7.1



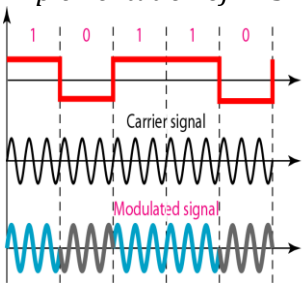
Binary phase shift keying (BPSK)

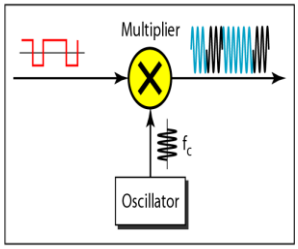
- ✓ The simplest PSK is binary PSK, in which we have only two signal elements, one with a phase of 0°, and the other with a phase of 180°.
- ✓ Binary PSK is as simple as binary ASK
- ✓ PSK is less susceptible to noise than ASK.
- ✓ PSK is superior to FSK because we do not need two carrier signals.





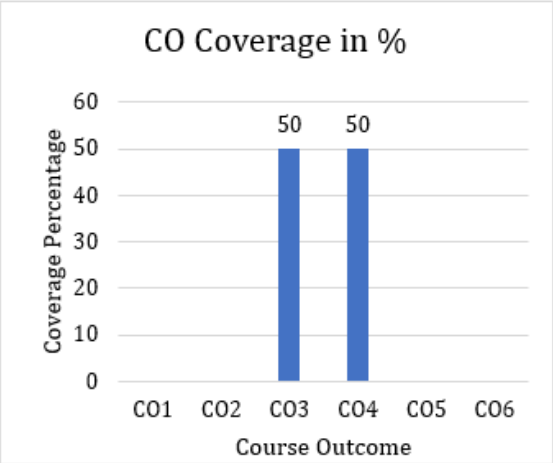
Implementation of BASK

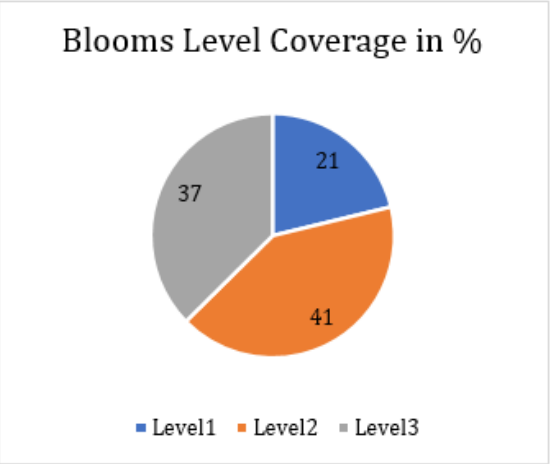




- ✓ The implementation of BPSK is as simple as that for ASK
- ✓ The reason is that the signal element with phase 180° can be seen as the complement of the signal element with phase 0°
- ✓ The polar NRZ signal is multiplied by the carrier frequency;
- ✓ the 1 bit (positive voltage) is represented by a phase starting at 0°;
- ✓ the 0 bit (negative voltage) is represented by a phase starting at 180°.

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


CO Coverage in %
60
50
40
30
20
10
0
Coverage Percentage
50
50
CO1
CO2
CO3
CO4
CO5
CO6
Course Outcome


Blooms Level Coverage in %
21
37
41
Level1
Level2
Level3