Academic Year: 2019-2020 Progressive Theory Test: I

Course Name and Code: DCC 22414 Class: CO4I A/B/C

Name of Course Teacher: Sayali Kadam Signature:

Q. No.	Questions	Marks	Cognitive Level	Mapped CO
1	**Attempt any four of the following (2 mark each)**			
a	What is an error detection? Enlist its methods. Ans: Whenever a message is transmitted, it may get scrambled by noise or data may get corrupted. To avoid this, we use error-detecting codes which are additional data added to a given digital message to help us detect if any error has occurred during transmission of the message. Basic approach used for error detection is the use of redundancy bits, where additional bits are added to facilitate detection of errors. Some popular techniques for error detection are: 1. Simple Parity check 2. Two-dimensional Parity check 3. Checksum 4. Cyclic redundancy check	02	R	CO3
b	Explain the terms attenuation, Bandwidth.. **Ans:** Attenuation is the loss of signal strength in networking cables or connections. This typically is measured in decibels (dB) or voltage and can occur due to a variety of factors. Bandwidth is the difference between the upper and lower frequencies in a continuous band of frequencies	02	R	CO2
c	Classify networks on the basis of their geography and define it. **Ans:** Classification of networks based on geography: LAN - Local Area Network	02	R	CO1

MAN - Metropolitan Area Network

WAN - Wide Area Network

CAN - Campus Area Network

PAN - Personal Area Network

LAN: LAN is local area network. LAN is privately-owned networks covering a small geographic area(less than 1 km), like a home, office, building or group of buildings. LAN transmits data with a speed of several megabits per second.

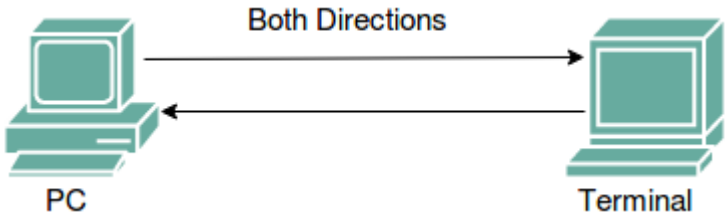
MAN: A Metropolitan Area Network (MAN) is a large computer network that spans a metropolitan area or campus. 2. A MAN typically covers an area up to 10 kms (city). The best example of MAN is the cable Television network, available in many cities.

WAN: WAN is wide area network. WAN is a long-distance communication network that covers a wide geographic area, such as state or country. The most common example is internet.

d | Differentiate between FDM and TDM. | 02 | R | CO2

Ans:

Sr. No.	Key	TDM	FDM
1	Definition	TDM stands for Time Division Multiplexing.	FDM stands for Frequency Division Multiplexing.
2	Signal	TDM works well with both analog as well as digital signals.	FDM works only with analog signal.
3	Conflict	TDM has low conflict.	FDM has high conflict.
4	Wiring	Wiring or Chip of TDM is simpler.	Wiring or Chip of FDM is complex.

		5	Efficiency	TDM is efficient.	FDM is quiet inefficient.			
		6	Sharing	Time is shared in TDM.	Frequency is shared in FDM.			
		7	Required Input	Syncronization pulse is mandatory in TDM.	Guard Band is mandatory in FDM.			
e	Explain full duplex communication. **Ans:** In full-duplex mode, both stations can transmit and receive simultaneously. In full_duplex mode, signals going in one direction share the capacity of the link with signals going in other direction, this sharing can occur in two ways: 1. Either the link must contain two physically separate transmission paths, one for sending and other for receiving. 2. Or the capacity is divided between signals travelling in both directions. Full-duplex mode is used when communication in both direction is required all the time. The capacity of the channel, however must be divided between the two directions. Example: Telephone Network in which there is communication between two persons by a telephone line, through which both can talk and listen at the same time.  					02	R	CO1
f	Compare Analog and Digital Signals **Ans:** 	Analog signals	Digital signals
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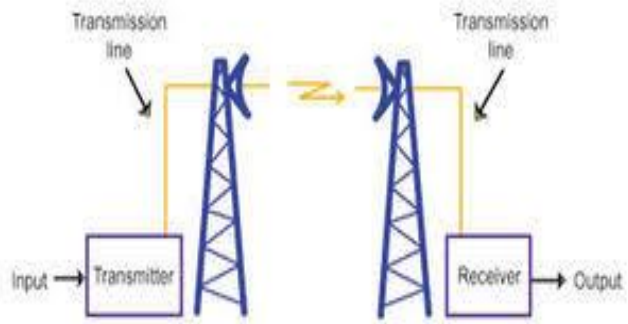
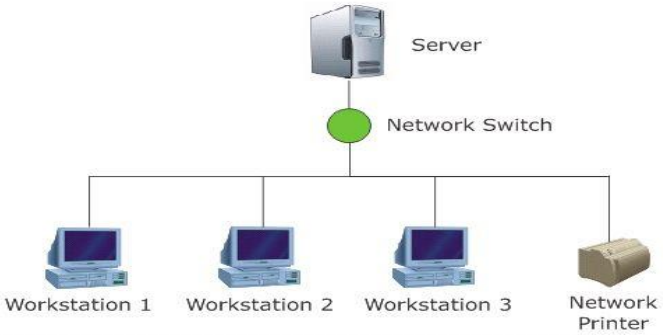
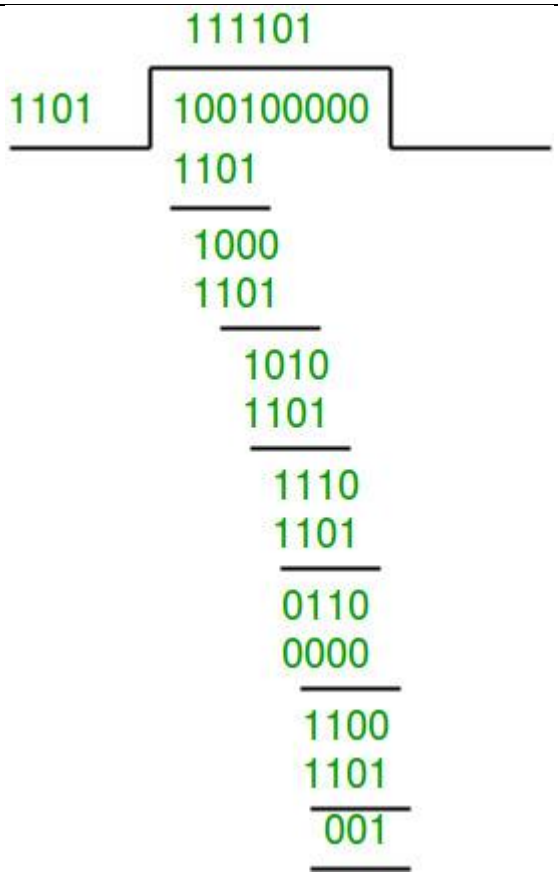
Analog signals are difficult to get analysed at first.	Digital signals are easy to analyse.				02	R	CO1

	Analog signals are more accurate than digital signals.	Digital signals are less accurate.			
	Analog signals take time to be stored. It has infinite memory.	Digital signals can be easily stored.			
	To record an analog signal, the technique used, preserves the original signals.	In recording digital signal, the sample signals are taken and preserved.			
	There is a continuous representation of signals in analog signals.	There is a discontinuous representation of signals in digital signals.			
	Analog signals produce too much noise.	Digital signals do not produce noise.			
	Examples of analog signals are Human voice, Thermometer, Analog phones etc.	Examples of digital signals are Computers, Digital Phones, Digital pens, etc.			
2	**Attempt any three of the following (4 mark each)**				
a	Explain Microwave (RF) link with diagram. **Ans:** • Microwaves are widely used for point-to-point communications because their small wavelength allows conveniently sized antennas to direct them in narrow beams, which can be pointed directly at the receiving antenna. • This allows nearby microwave equipment to use the same frequencies without interfering with each other, as lower frequency radio waves do. the microwave band has a bandwidth 30 times that of all the rest of the radio spectrum below it.		04	R	CO2

	• A disadvantage is that microwaves are limited to line-of-sight propagation; they cannot pass around hills or mountains as lower frequency radio waves can. • Microwave radio transmission is commonly used in point-to-point communication systems on the surface of the Earth, in satellite communications, and in deep space radio communications. • Other parts of the microwave radio band are used for radars, radio navigation systems, sensor systems, and radio astronomy. 			
b	Explain Client-server architecture with its advantages and disadvantages: **Ans:**  • Client-server architecture, architecture of a computer network in which many clients (remote processors) request and receive service from a centralized server (host computer). • Client computers provide an interface to allow a computer user to request services of the server and to display the results the server returns. Servers wait for requests to arrive from clients and then respond to them.	04	R	CO1

	• Ideally, a server provides a standardized transparent interface to clients so that clients need not be aware of the specifics of the system (i.e., the hardware and software) that is providing the service. Clients are often situated at workstations or on personal computers, while servers are located elsewhere on the network, usually on more powerful machines. • Advantages: o Centralized system with all data in a single place. o Cost efficient requires less maintenance cost and Data recovery is possible. o The capacity of the Client and Servers can be changed separately. • Disadvantages: o If all the clients simultaneously request data from the server, it may get overloaded. ... o If the server fails for any reason, then none of the requests of the clients can be fulfilled. ... o The cost of setting and maintaining a client server model are quite high.			
c	Why is circuit switching preferred over packet switching in voice communication? **Ans:** • Using circuit switching allows you to keep a channel established for high priority voice calls to give the users the best chance to communicate with each other. • In contrast, packet switching uses a more malleable approach so that traffic can travel a variety of paths. One of the main reasons is that it decreases the amount of delay the user experiences before and during a call. • Circuit switching is adept at making sure that delay is minimized during phone calls so that the callers can enjoy the best end-user experience possible. • Packet switching is unable to sustain the same standard of service to users throughout	04	U	CO2

	the call.			
d	Explain CRC with suitable example. **Ans:** • CRC or Cyclic Redundancy Check is a method of detecting accidental changes/errors in the communication channel. • CRC uses Generator Polynomial which is available on both sender and receiver side. An example generator polynomial is of the form like x3 + x + 1. This generator polynomial represents key 1011. Another example is x2 + 1 that represents key 101. n : Number of bits in data to be sent from sender side. k : Number of bits in the key obtained from generator polynomial. • **Sender Side (Generation of Encoded Data from Data and Generator Polynomial (or Key)):** 1. The binary data is first augmented by adding k-1 zeros in the end of the data 2. Use ***modulo-2 binary division*** to divide binary data by the key and store remainder of division. 3. Append the remainder at the end of the data to form the encoded data and send the same • **Receiver Side (Check if there are errors introduced in transmission)** Perform modulo-2 division again and if the remainder is 0, then there are no errors. **Example** Data word to be sent - 100100 Key - 1101 [Or generator polynomial $x^3 + x^2 + 1$] Sender Side:	04	A	CO3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