LOYOLA COLLEGE (AUTONOMOUS) CHENNAI – 600 034

B.C.A. DEGREE EXAMINATION – **COMPUTER APPLICATIONS**

FIFTH SEMESTER – **NOVEMBER 2024**

UCA 5601 – DATA COMMUNICATION AND NETWORKS

Date: 21-11-2024 Dept. No. Max. : 100 Marks

Time: 09:00 am-12:00 pm

	SECTION A - K1 (CO1)	
	Answer ALL the Questions -	**(10 x 1 = 10)**
1.	**Answer the following**	
a)	What is Mesh Topology?	
b)	Define Distortion.	
c)	Define Block coding.	
d)	What is Sampling?	
e)	Define Radio wave.	
2.	**Fill in the blanks**	
a)	In _____ topology, each device is connected with central hub or switch.	
b)	During analog-to-digital conversion, the signal is sampled at specific intervals in a process known as _____.	
c)	In _____ transmission, bits are transmitted simultaneously, each across its own wire.	
d)	The part of a fiber-optic cable that reflects light back into the core to prevent signal loss is called the _____.	
e)	_____ errors occur when a bit is altered during transmission.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**MCQ**	
a)	What type of transmission is involved in communication between a computer and a keyboard? a) Half-duplex b) Full-duplex c) Simplex d) Automatic	
b)	The signal rate is sometimes called the ___ rate a) Baud b) bit c) signal d) None of the above	
c)	What is the primary function of Pulse Code Modulation (PCM)? a) Analog to Analog conversion b) Digital to Analog conversion c) Analog to Digital conversion d) Digital to Digital conversion	
d)	Coaxial cable consists of _____ concentric copper conductors a) 1 b) 2 c) 3 d) 4	
e)	Which of the following describes the MAC address? a) A 32-bit number used for network layer addressing b) A 64-bit address used for error checking c) A unique 48-bit hardware address assigned to network interfaces d) A temporary address assigned during data transmission	
4.	**True or False**	
a)	Line coding only applies to analog signals, not digital signals.	
b)	Noise in a communication system is always caused by human-made interference.	
c)	Delta modulation encodes the difference between successive samples of a signal.	
d)	Statistical Time Division Multiplexing (Statistical TDM) allocates bandwidth equally to all devices, regardless of their data needs.	
e)	If the value of checksum is zero, then the message status is accepted	

SECTION B - K3 (CO2)	
Answer any TWO of the following	**(2 x 10 = 20)**
5.	Develop a note on data representation and data flow in communication.
6.	Construct the different types of serial transmission with neat diagrams.
7.	Build the working model of AM, FM and PM to convert analog into analog signal.
8.	Identify and write the different types of antennas used for communications and its applications.
SECTION C – K4 (CO3)	
Answer any TWO of the following	**(2 x 10 = 20)**
9.	Analyze and write the functionalities of Physical layer, Data Link layer, Network layer, Transport layer of OSI model.
10.	Compare Time domain and Frequency Domain plot in Analog and digital signal.
11.	Compare AMI and pseudo ternary line coding with an example.
12.	Analyze the different classes of guided media used for communication.
SECTION D – K5 (CO4)	
Answer any ONE of the following	**(1 x 20 = 20)**
13.	Explain the different types of Networks and Switches in data communications.
14.	Evaluate the different types of multiplexing with neat diagram.
SECTION E – K6 (CO5)	
Answer any ONE of the following	**(1 x 20 = 20)**
15.	Create the encoding signal for the following data stream (i) 01010101 (ii) 00110011 using RZ, NRZ-I, NRZ-L and Manchester encoding.
16.	Estimate the checksum to send 4 frames each of 8 bits, where the frames are 11001100, 10101010, 11110000 and 11000011 and also the check the receiver side.
