



Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Academic year 2023-2024

Department of Electronics and Telecommunication Engineering

MSE paper

Subject : Consumer Electronics (OE)

Time : 1 hr.

Date : 07/03/2024

Max marks : 30Marks

Note : 1. All questions are compulsory.

2. Assume suitable data wherever necessary.

T.E-VI - Com/CSDS/ETC

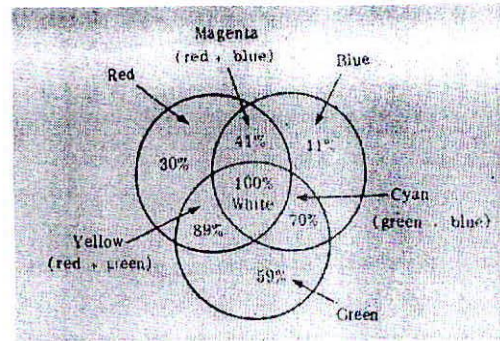
Q. No.	Question	CO	Marks
1	A) With the neat diagram and graph, show how a textile electrostatic clutch with high force density is used in a kinesthetic feedback glove?	CO1	5
	B) Compare LCD and LED Displays.	CO1	5
2	A) With a neat diagram explain the I2C protocol for data transmission.	CO3	5
	B) What are the key features of USB?	CO3	5
OR			
2	A) If a ZigBee network operates at a symbol rate of 250 ksymbols/s using O-QPSK modulation, and each symbol represents 2 bits of data, what is the effective data rate in bits per second?	CO3	2
	B) In a ZigBee network, the transmitted signal power is 5 mW, and the received signal power at a distance of 10 meters is measured to be 50 μ W. What is the path loss in decibels (dB)?	CO3	2
	C) In a ZigBee network with 16 available channels operating in the 2.4 GHz ISM band, if each channel has a bandwidth of 5 MHz, how much total bandwidth is available for communication?	CO3	2
	D) In a ZigBee network, if the PER is measured to be 0.01, meaning that 1% of transmitted packets are received with errors, and the network sends 100 packets per second, how many packets are received successfully per second?	CO3	2
	E) If the speed of propagation of electromagnetic waves in air is approximately 3×10^8 meters per second, and a ZigBee signal travels a distance of 100 meters, what is the propagation delay in microseconds?	CO3	2
3	A) What is compatibility in TV transmission? What are the requirements to be met to make color system fully compatible?	CO4	5

3

B) Diagram shows the additive color mixing, the effect of projecting green, red and blue beams on a white screen in such a way that they overlap.

CO4

5



Draw the waveforms for V_R , V_G , V_B and V_Y for red, green, blue and Luminance respectively for the color bar pattern shown below.

