Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India

(Autonomous Institute Affiliated to University of Mumbai)

Academic year 2024-2025

Department of Electronics and Telecommunication Engineering

MSE paper

Subject : Consumer Electronics (Open Elective)

Date : 24/09/2024

Time : 1 hr.

Max marks : 30Marks

Note : 1. All questions are compulsory.

2. Assume suitable data wherever necessary.

B.E- VII - AIML/COM/CSDS

Q. No.	Question	CO	Marks
1	A) Explain with the neat diagram working of cathode ray tube (CRT)	CO1	7
	OR		
	B) What is Haptic devices? Explain working of any one haptic device with the neat diagram.	CO1	7
	C) Illustrate the trade-offs between different touch panel technologies like resistive and capacitive touchscreens. Consider factors like cost, durability, accuracy, multi-touch capabilities, and suitability for different applications. When might one technology be preferable over the other? Draw suitable diagram.	CO1	8
2	A) Scenario: A WiFi network operates in the 5 GHz band using the 802.11ac standard. The network transmits data at a rate of 900 Mbps. Each WiFi packet has a fixed header size of 25 bytes and a variable payload size. Questions:	CO3	
	1. How long does it take to transmit a WiFi packet with a payload size of 1024 bytes?		2
	2. If the network experiences a 10% packet loss rate, what is the maximum achievable throughput of the network?		2
	3. The network uses a channel with a bandwidth of 80 MHz. What is the channel utilization if the average time between packet transmissions is 2 milliseconds (ms)?		2
	B) A Bluetooth device transmits at a power of 0 dBm and the minimum received signal strength for reliable communication is -80 dBm. Assuming free space path loss model, what is the estimated maximum range of the device?	CO3	2
	C) In a ZigBee network, the transmitted signal power is 4 mW, and the received signal power at a distance of 10 meters is measured to be 40 µW. What is the path loss in decibels (dB)?	CO3	2
	D) Explain with neat diagram and wave form working of I2C Communication Protocol.	CO3	5