



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

Reexam July 2024

Subject : Consumer Electronics (OEET3)

Time : 3 hr.

Sem VI **A11** **VII**
Max marks : 100

Instructions : 1. All questions are compulsory.

2. Assume suitable data wherever necessary.

3. Draw Suitable diagram wherever necessary.

Q. No.	Questions	Marks	CO-BL
Q1			
A)	Summarize the following haptic interfaces A) Touch-based Haptic Interfaces. B) Wearable Haptic Interfaces. C) Skin-attachable Haptic Interfaces. D) Mid-air Haptic Interfaces. E) Neuro-haptic Interfaces. based on following parameters i) Representative method, ii) Strengths, iii) Challenges and Opportunities, iv) Applications	10M	CO1 - II
B)	Explain with neat diagram operation of LCD display.	05M	CO1 - II
Q2			
A)	With a neat waveform, explain RS232 Serial Communication Protocol. Also comment on Basics, Working & Specifications of RS232 Serial Communication.	07 M	CO3 - II
B)	1. A Bluetooth device uses Bluetooth Low Energy (BLE) with a symbol rate of 1 Mbps and QPSK modulation. Each symbol represents 2 bits of data. What is the effective data rate in bits per second? 2. A BLE device needs to transmit a data packet of 20 bytes. The data rate is 1 Mbps as calculated in question 1. How long does it take to transmit the packet in milliseconds?	08 M	CO3 - III
Q3			
A)	Explain with neat diagram how color television camera system generates color signals $(Y) = 0.3V_R + 0.59 V_G + 0.11V_B$? OR	10M	CO4 - II
A)	Explain the block diagram of NTSC Encoder. Also compare NTSC and PAL system.	10M	CO4 - II
B)	In the early days of color television, a major hurdle was ensuring everyone could enjoy the new technology. How did engineers design color TV systems to be compatible with existing black-and-white televisions?	05M	CO4 - II
Q4			
A)	Explain the basic characteristics of sound signals using appropriate definitions and examples. 1. Loudness 2. Pitch 3. Frequency Response 4. Fidelity 5. Sensitivity of Human ear for Sound	05M	CO2 - II
B)	Design a small refrigerator for a dorm room. Determine the minimum thickness of	10M	CO2 - III

	insulation ($k = 0.03 \text{ W/(m}^2\text{K)}$) required to maintain a desired temperature difference (ΔT) of 15°C between the inside (5°C) and outside (20°C) of the refrigerator. The total surface area of the refrigerator (excluding the door) is 1.5 m^2 . The rate of heat transfer (Q) through the insulation needs to be limited to 50 W .		
	OR		
B)	Design a microwave oven with a cavity volume of 25 liters. Determine the required power rating to heat 500 grams of food from room temperature (25°C) to serving temperature (75°C) in 3 minutes. Assume an efficiency of 65%.	10M	CO2 - III
Q5			
A)	What kinds of mobile wearable devices can be used to improve a person's health and/or a medical condition ? Explain with Example.	10 M	CO5 - II
B)	Draw a labeled diagram of an ECG waveform, and briefly explain the following components: P wave, PR interval, QRS complex, ST segment, QT interval, and T wave.	10 M	CO5 - II
Q6			
A)	What specific components make up a CCTV system and how are they utilized in surveillance setups?	10 M	CO6 - II
B)	What characteristics define a biometric as effective for enhancing network security?	10 M	CO6 - II