



Vidya Academy of Science & Technology Technical Campus

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"A Unit of Vidya International Charitable Trust"

QUESTION BANK

S8 ELECTRONICS AND COMMUNICATION ENGINEERING

2019 SCHEME

Academic Year -2023-24 (EVEN)

Vidya Academy of Science & Technology Technical Campus



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WIRELESS COMMUNICATION (ECT 402)**QUESTION BANK**

Qn. No	MODULE – 1	Mark	Year
1	a. Enumerate the different features of a 4G mobile communication system. b. Give important features of 5G system. c. List three differences between 2G and 3G systems. d. Compare 1G, 2G, 3G & 4G systems. e. Describe the features of the GSM system architecture with the help of a neat block diagram.	7 4 3 4 7	June 2023 Model Model Model Oct 2023
2	a. What are the different standards used to implement the Wireless Local Area Network (WLAN)? Explain by comparing. b. Describe WIMAX architecture. c. Mention the features of Bluetooth d. Compare the wireless networks PAN and WLAN.	7 7 5 5	June 2023 July 2021 July 2021 Oct 2019
3	If a Signal to Interference Ratio (SIR) of 20dB is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity? The path loss exponent $n=4$. Assume there are 12 co-channel cells in first tier and all of them are at the same distance from mobile.	7	June 2023
4	How do co-channel interference and adjacent channel interference affect cellular system capacity?	7	June 2023
5	a. What is cell splitting? How does it improve system performance? b. Discuss different handoff strategies.	7 7	Model July 2021
6	A total of 33MHz of bandwidth is allocated to an FDD cellular system which uses two 25kHz simplex channels to provide full-duplex voice & control channels. Compute the number of channels available per cell if the system uses 7- cell reuse.	7	Model
7	Explain channel assignments and handoff strategies in detail	10	May 2019
8	Explain the different channel assignment strategies used in cellular system.	7	Oct 2023

Qn. No	MODULE – 2	Mark	Year
1	Explain the notion of delay spread and coherence bandwidth.	3	Model
2	What is the importance of Two Ray model? Derive the expression for path loss in a two ray ground reflection model.	8	June 2023
3	A transmitter radiates a sinusoidal carrier frequency of 3GHz. For a vehicle moving at a speed of 72Kmph, compute the received frequency if the mobile is moving i) Directly towards the transmitter ii) Directly away from the transmitter	6	June 2023
4	What is Fading? What are different types? What are the main factors affecting fading? Calculate the coherence time of a channel, if doppler shift is produced due to the movement of a mobile with a velocity of 50 m/sec and operating at 1900MHz.	8 5	June 2023 June 2023
5	Give the expression for capacity of flat fading AWGN channel with CSIR. Describe how it is obtained assuming AWGN capacity.	3	Model
6	(a) Derive time-varying impulse response of multipath wireless channel. (b) Consider a flat-fading channel with iid channel gains $g[i]$ which can take on values $g_1=0.05$ with probability $p_1=0.1$, $g_2=0.5$ with probability $p_2=0.5$, and $g_3=1$ with probability $p_3=0.4$. The transmit power is 10mW, noise spectral density $N_0 = 10^{-9}$ W/Hz, and channel bandwidth is 30kHz. Assume instantaneous CSI-R, but transmitter does not have CSI. Compute the capacity of the channel.	7 7	MODEL
7	Explain Free-Space Path Loss and derive the expression. Determine the path loss for a 3.4-GHz signal propagating 20,000 m.	7	KTU SEP 2020
8	Explain Ergodic capacity in detail.	5	Model
9	Derive the expression for the impulse response model of a multipath channel	7	Oct 2023
10	What is the received power in dBm for a free space signal, whose transmit power is 1W and carrier frequency is 2.4GHz. If the receiver is at a distance of 1 mile (1.6 km) from the transmitter. What is the path loss in dB?	7	Oct 2023
11	Consider a wireless channel, where power falloff with distance follows the formula $P_r(d) = P_t(d_0/d)^3$ for $d_0=50$ m. Assume the	7	Oct 2023

	channel has bandwidth $B=50\text{KHz}$ and AWGN with noise PSD $N_0/2$, Where $N_0=10^{-9}\text{ W/Hz}$. For a transmit power of 2W , find the capacity of this channel for a receive transmit distance of 200m and 1KM ? What is your conclusion?		
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MODULE 3			
Sl.No.	Questions	Marks	KTU, Year
1	a. Derive expression for average probability of error in BPSK under Rayleigh flat fading, when the symbol duration is roughly equal to channel coherence time.	8	June 2023
	b)How can the subcarrier fading be mitigated in multicarrier modulation system?	6	
2	a. With the help of neat block diagram explain Multicarrier modulation in OFDM transmitter and receiver section.	9	June 2023
	b. List out the advantages and disadvantages of OFDM	5	
3	What is the purpose of using a cyclic prefix in an OFDM system?	3	MODEL
4	Define outage probability.	3	MODEL
5	What is Peak-to-Average Power-Ratio (PAPR) in an OFDM system? How can it be reduced	7	MODEL
6	(a) Determine the average SNR per bit of BPSK modulation in Rayleigh slow-fading channel such that 95% of the times, average probability of bit error is less than 10^{-4} .	5	MODEL
7	Under Rayleigh flat-fading, derive an expression for the required average SNR to ensure that outage probability does not below P_{out} .	7	Model
MODULE IV			
1	Why do we say that maximal ratio combining achieves full diversity?	7	MODEL
2	a. Derive the expression for the impulse response $H_{eq}(z)$, of a Minimum Mean Square Error (MMSE) equaliser.	7	June 2023
	b. Compare Frequency Division Multiple Access (FDMA) and Time Division Multiple Access (TDMA) techniques.	7	June 2023
3	a. Design a three tap zero forcing equaliser with following parameters $P(0)=1$, $P(-1)=0.3$, $P(-2)=-0.05$, $P(1)=0.2$, $P(2)=-0.06$.	7	June 2023
	b. Describe the principle of Selection Combining (SC) diversity	7	

	technique.		
4	(a) Explain Least-Mean-Square algorithm for equalization. (b) Compute the average probability of bit error of BPSK under maximal-ratio combining two-branch diversity with iid Rayleigh fading. Average SNR on each branch is 10dB.	9 5	MODEL
5	Describe Alamouti scheme for 2x2 MIMO.	7	June 2023
6	Find the outage probability of BPSK modulation at $P_b = 10^{-3}$ for a Rayleigh fading channel with SC diversity for $M = 1$ (no diversity) $M = 2$. Assume equal branch SNRs of 15 dB.	3	Model
7	Compare multiple-access schemes TDMA, FDMA and CDMA	7	Model
8	Consider a channel with impulse response $h(t) = \exp(-t/T) u(t)$. Find two- tap Zero-forcing equalizer for this channel	6	Model
9	Describe the working principle of a Zero Forcing Equaliser with the help of a neat diagram.	7	OCT 2023
10	Describe the steps to compute tap weights iteratively in LMS algorithm?	7	OCT 2023
MODULE V			
1	Distinguish between critical frequency and maximum usable frequency.	3	MODEL
2	Define virtual height in antennas.	3	MODEL
3	a. Derive an expression for the LOS distance in km when the antenna heights above ground are h_t and h_r respectively for the transmitter and receiver antennas. b. Analyze the effect of earth's magnetic field on radio wave propagation.	7 7	June 2023
4	a. A receiving antenna is located 60km from the transmitting antenna. The Height of the transmitting antenna is 100meters. What is the required height of the receiving antenna. Consider effective radius of earth. b. Derive the relation between the terms (i) Critical Frequency (ii) Skip Distance (iii) Maximum Usable Frequency	7 7	June 2023

5	Describe Ground wave propagation.	5	Model
6	a) A television transmitter antenna mounted at a height of 200 meters and the receiving antenna has a height of 20 meters. What is the maximum spacing between the transmitter and receiver through tropospheric propagation? Also compute the radio horizon in this case.	7 7	OCT 2023
7	List out the features of the various modes of radio wave propagation. What is the critical frequency for reflection at vertical incidence if the maximum value of electron density is 1.24×10^8 electrons/cc?	8 6	Oct 2023

ECT 426 REAL TIME OPERATING SYSTEMS

Module 1

Sl No	Questions	Marks	KTU, Year
1	List any six functions of an operating system	3	Model Question Paper
2	Differentiate microkernel and exokernel structures of operating systems.	3	Model Question Paper
3 a	Explain the functions of operating system as Resource Manager.	7	Model Question Paper
b	Describe the structure of a Process Control Block	7	Model Question Paper
4a	Explain the monolithic and microkernel architectures of OS kernel.	7	Model Question Paper
b	Draw the process state diagram and explain the different states	7	Model Question Paper
5	Explain any three objectives of an operating system.	3	June 2023
6	Draw the process state transition diagram and explain.	3	June 2023
7	a) Mention the importance of kernel in an operating system. Explain the main services offered by kernel. (b) Explain any three types operating systems in detail.	5 9	June 2023
8	a) Draw and explain the structure of a process control block in an operating system. b) Explain the functions of operating system as viewed from the user side.	7 7	June 2023

Module 2																					
Sl No	Questions	Marks	KTU,Year																		
1	Explain the different operations on processes.	3	Model Question Paper																		
2	Explain the differences between Pre-emptive and Non pre-emptive scheduling policies.	3	Model Question Paper																		
3 a	Explain the Shortest Remaining Time First algorithm with a suitable example.	7	Model Question Paper																		
b	<div>Schedule the given 5 processes with Round Robin scheduling.<table><tr><td>ProcessID</td><td>ArrivalTime</td><td>BurstTime</td></tr><tr><td>P1</td><td>0</td><td>5</td></tr><tr><td>P2</td><td>1</td><td>3</td></tr><tr><td>P3</td><td>2</td><td>1</td></tr><tr><td>P4</td><td>3</td><td>2</td></tr><tr><td>P5</td><td>4</td><td>3</td></tr></table></div> <div>Draw the Gantt chart and calculate the average waiting time and turn-around time for these processes if time quantum is 2 units,</div>	ProcessID	ArrivalTime	BurstTime	P1	0	5	P2	1	3	P3	2	1	P4	3	2	P5	4	3	7	Model Question Paper
ProcessID	ArrivalTime	BurstTime																			
P1	0	5																			
P2	1	3																			
P3	2	1																			
P4	3	2																			
P5	4	3																			
4	Describe the features of multilevel feedback queue scheduling algorithm.	3	June2023																		
5	List the problems associated with multi-process scheduling. How they can be solved?	3	June2023																		
6	<div>a) Differentiate process and thread in a system. Explain about multithreading models.</div> <div>b) Explain the Shortest Remaining Time Next scheduling algorithm with an example.</div>	<div>7</div> <div>7</div>	June2023																		
7	<div>a) Illustrate the different levels of scheduling in a system with a neat diagram.</div> <div>b) Schedule the following processes with SJF and Round Robin algorithms and compare their performances. Assume that all processes are arriving at time zero.</div>	<div>6</div> <div>8</div>	June2023																		

	<table><tr><th>ProcessID</th><th>ArrivalTime</th><th>BurstTime</th></tr><tr><td>P1</td><td>2</td><td>10</td></tr><tr><td>P2</td><td>3</td><td>13</td></tr><tr><td>P3</td><td>1</td><td>20</td></tr><tr><td>P4</td><td>4</td><td>7</td></tr></table>	ProcessID	ArrivalTime	BurstTime	P1	2	10	P2	3	13	P3	1	20	P4	4	7		
ProcessID	ArrivalTime	BurstTime																
P1	2	10																
P2	3	13																
P3	1	20																
P4	4	7																

<u>Module 3</u>			
Sl No	Questions	Marks	KTU,Year
1	Draw the state diagram of RTOS queue and explain	3	Model Question Paper
2	What you mean by priority inversion in real time systems? How the operating system manages this issue?	3	Model Question Paper
3 a	Draw the structure of a real time operating system and explain.	7	Model Question Paper
b	Differentiate between exceptions and interrupts. What are the different classifications of exceptions	7	Model Question Paper
4 a	Explain how synchronization is achieved between different tasks in a real time operating system	7	Model Question Paper
b	Describe any two inter task communication mechanisms in a real time operating systems.	7	Model Question Paper
5	a) Explain the different types of semaphores used in a real time system. b) Draw the structure and explain the characteristics of a real time operating systems. Illustrate the same with an example.	8 6	June2023
6	a) Describe any two inter task communication mechanisms used in RTOS with relevant diagrams. b) Explain how exceptions and interrupts helps in designing an	8 6	June2023

7	Explain suspended, pended and delayed tasks.	3	June2023
8	Define exception. Explain the different classes of exceptions.	3	June2023

Module 4

Sl No	Questions	Marks	KTU,Year												
1	Explain EDD algorithm with an example	3	Model Question Paper												
2	Explain the task control block of a real time kernel.	3	Model Question Paper												
3 a	Illustrate Horn’s algorithm with an example.	7	Model Question Paper												
b	Explain EDF algorithm with precedence constraints.	7	Model Question Paper												
4 a	Explain the precedence constraints of a real time task.	7	Model Question Paper												
b	<div>Verify the schedulability and construct the scheduling according to the rate monotonic algorithm for the following set of periodic tasks r_1, r_2 and r_3</div> <table><tr><td></td><td>Ci</td><td>Ti</td></tr><tr><td>r_1</td><td>3</td><td>5</td></tr><tr><td>r_2</td><td>1</td><td>8</td></tr><tr><td>r_3</td><td>1</td><td>10</td></tr></table> <div>Where Ci and Ti are the computation time activation period of the task.</div>		Ci	Ti	r_1	3	5	r_2	1	8	r_3	1	10	7	Model Question Paper
	Ci	Ti													
r_1	3	5													
r_2	1	8													
r_3	1	10													
5	State Jackson’s algorithm for real time scheduling. Illustrate it with an example.	3	June2023												
6	Explain the classification of real time tasks based on deadline.	3	June2023												
7	a) Explain the timing constraints of a Real Time Operating System. (b) List the performance measure of a real time scheduling algorithm.	7 7	June2023												

8	a) Draw the detailed process state transition diagram and explain each state.	9	June2023
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<u>Module 5</u>			
Sl No	Questions	Marks	KTU,Year
1	List the features of FreeRTOS.	3	Model Question Paper
2	Illustrate the threads in MicroC/OS-II operating system.	3	Model Question Paper
3 a	Illustrate the implementation of a real time system with an example,	7	Model Question Paper
b	Explain the inter-process communication techniques used in Micro C/OS-II	7	Model Question Paper
4 a	Compare the features of PSOS, VRTX and RT Linux 7	7	Model Question Paper
b	Prepare suitable requirements table for an RTOS control system used in adaptive cruise control.	7	Model Question Paper
5	a) Explain any four features of Free RTOS. b) Describe the inter-process communication techniques used in Micro C/OS-II.	8 6	June2023
6	a) Explain the features of RT Linux RTOS. (b) With a suitable requirement table and block diagram explain the real time operating system used in an adaptive cruise control system	4 10	June2023
7	Compare the features of PSOS and VTRX.	3	June2023
8	List the heap implementation schemes used in Free RTOS. Mention the functions of each.	3	June2023

QUESTION BANK

S8 ELECTRONICS AND COMMUNICATION ENGINEERING

2019 SCHEME

QUESTIONS COMPILED BY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
VIDYA ACADEMY OF SCIENCE & TECHNOLOGY TECHNICAL CAMPUS, KILIMANOOR

ECT 458 INTERNET OF THINGS

MODULE I

SL.No	Questions	Marks	KTU, YEAR
1	Explain what do you mean by logical design of IoT. What does it include?	3	June 2023
2	Explain the IoT enabling technologies	3	June 2023
3	List different Cloud Deployment Models	3	June 2023
4	Define IoT. Explain the different characteristics of IoT.	7	June 2023
5	Explain with figure Level-5 IoT system. Give an example	7	June 2023
6	Explain different communication models used in IoT.	8	June 2023
7	Explain with figure the architectural view of IoT	6	June 2023
8	Explain the different characteristics of IoT.	3	Oct 2023
9	List the different levels of IoT with an example	3	Oct 2023
10	Explain with figure the IoT Functional blocks	6	Oct 2023
11	Explain the different protocols used in the link layer, network layer, transport layer and application layer protocols.	9	Oct 2023
12	Explain what do you mean by logical design of IoT. What does it include?	5	Oct 2023
MODULE II			
1	Define Sensors, Actuators, and Smart Objects	3	June 2023
2	List the differences between IoT and M2M.	3	June 2023
3	Why SDN is preferred rather than conventional network architectures?	3	June 2023
4	Define a smart object. Explain the four defining characteristics of a Smart Object	3	June 2023
5	Explain the issues of conventional networking architectures? How is it solved in SDN?	7	June 2023
6	Explain with figure Network Function Virtualization use case for IoT.	7	June 2023
7	Explain the differences between IoT and M2M.	8	Oct 2023
8	Explain Network Function Virtualization for IoT.	6	Oct 2023
9	What are smart objects? What are their defining characteristics and the trends?	9	Oct 2023
10	Explain the limitations of smart objects in WSNs.	5	Oct 2023

11	Explain the characteristics and attributes to be considered when selecting and dealing with connecting smart objects.	8	Oct 2023
12	Explain Wireless Sensor Networks	6	Oct 2023
	MODULE III		
1	Explain the features of Modbus	3	June 2023
2	Explain the significance of 6LoWPAN Adaptation Layer	3	June 2023
3	Explain ZigBee stack architecture.	3	Oct 2023
4	Explain the need for IP optimization in IoTs?	3	Oct 2023
5	Explain IEEE 802.15.4 physical layer, MAC layer and security implementation with the help of frame formats.	9	June 2023
6	Explain the features of RPL.	5	June 2023
7	Explain IEEE 802.15.4 physical layer, MAC layer and security implementation with the help of frame formats.	8	June 2023
8	Explain what are network layer the next generation IP-based protocols used in IoT.	6	June 2023
9	Explain NB-IoT-Network layer	5	Oct 2023
10	Explain LoRa WAN architecture. Give a detailed description of the physical layer and MAC layer of LoRa WAN	9	Oct 2023
11	Explain how RPL provides the routing solution for IP smart objects in IoT	5	Oct 2023
12	Explain LoraWAN architecture. Give a detailed description of the physical layer and MAC layer of LoraWAN	9	Oct 2023
	MODULE IV		
1	List different Cloud Deployment Models	3	June 2023
2	What is an IoT Device? Give an example.	3	June 2023
3	Explain ZigBee stack architecture.	3	Oct 2023
4	Explain the need for IP optimization in IoTs?	3	Oct 2023
5	List the usages of virtualisation functions for data store, networks and servers	6	June 2023
6	Describe cloud computing service models in a software architectural concept, everything as a service	8	June 2023
7	Explain the features of Raspberry Pi	7	June 2023
8	Explain an IoT Device. Draw basic building blocks of an IoT Device	7	June 2023
9	Explain the four service models of clouds	8	Oct 2023
10	List the reasons for employing Raspberry Pi as the development platform for IoT	6	Oct 2023

	applications. Mention the main components of Raspberry Pi		
11	What is an IoT Device? Explain the basic building blocks of an IoT Device. Give examples.	9	Oct 2023
12	Draw the Block diagram of an IoT Device	5	Oct 2023
MODULE V			
1	Define message integrity? How it is checked?	3	June 2023
2	Explain the three users that IoT applications must support through aggregated data in smart parking.	3	June 2023
3	What is security tomography? When is it useful?	3	Oct 2023
4	Explain briefly four-layered Smart City IoT Architecture	3	Oct 2023
5	Differentiate with example use case and misuse case. Explain their purpose.	6	June 2023
6	Explain the layered attacker model and possible attacks on the layers.	8	June 2023
7	Illustrate with figure the functions of a security function group in functional view of IoT reference architecture.	9	June 2023
8	List the top ten vulnerabilities for attack.	5	June 2023
9	Explain with diagram the 4-layer smart city architecture	8	Oct 2023
10	Demonstrate street lighting architecture in smart cities with the help of a Diagram	6	Oct 2023
11	Explain Smart City Security Architecture	6	Oct 2023
12	Explain with figure how air pollution monitoring system.	8	Oct 2023

ECT 414 BIOMEDICAL ENGINEERING QUESTION BANK

Prepared by

Ms. Aswani S

Asst.Professor, ECE

MODULE 1

Sl No	Question	Marks	KTU Year
1	How does polarisation and depolarisation occur in a cell	3	OCT 2023
2	State the Nernst relation.	3 4	OCT 2023 JUN 2023
3	a) Describe any three types of bio-potential electrodes with a diagram b) Explain the use of isolation amplifiers	12 2	OCT 2023
4	a) Explain any three types of bio-electric potentials. b) Explain any one biopotential amplifier used in clinical instruments with diagram.	6 8	OCT 2023
5	We know that the resting potential of a cell is about -70 mV. Illustrate the mechanism by which the cell potential is increased to +20 mV when excited	3	OCT 2023
6	List three typical features of a biopotential amplifier.	3	JUN 2023
7	a) Explain the working of an isolation amplifier with circuit diagram. Why would you prefer isolation amplifier as a biopotential amplifier b) Explain the basic structure of needle electrodes. List any two applications.	8 6	JUN 2023
8	a) Draw and explain the basic block diagram of a biomedical instrumentation system.	10	JUN 2023
9	Explain about electrode-electrolyte interface and the electrical activity associated with one contraction in a muscle.	8	MODEL
10	Explain chopper amplifier with a neat diagram? State applications	7	MODEL

MODULE 2

Sl No	Question	Marks	KTU year
1	Explain the electro conduction system of the heart	3	OCT 2023 JUN 2023
2	Illustrate any one non-invasive pressure measurement technique.	3	OCT 2023
3	a) Explain the working of ECG machine with diagram. b) Illustrate the working of electromagnetic blood flow meter.	7 7	OCT 2023 JUN 2023
4	a) Explain any one indirect method of blood pressure measurement b) What are Korotkoff Sounds? Explain its different phases	8 6	OCT 2023
5	Draw the ECG of a person with a healthy heart and correlate the signal with the working of the heart	3	JUN 2023

6	With the help of relevant diagrams, explain the principle of operation of ultrasonic blood flow meter.	3	JUN 2023
7	Explain the method of ultrasonic non-invasive blood pressure measurement	7	JUN 2023
8	Explain the different lead systems used for the measurement of ECG.	9	JUN 2023
9	Draw and explain the Einthoven triangle	8	MODEL
10	Compare direct and indirect blood pressure measurement	3	MODEL

MODULE 3

Sl No	Question	Marks	KTU year
1	What are the uses of EMG in modern medicine	3	OCT 2023
2	Explain the working of spirometer	3,7	OCT 2023 JUN 2023
3	a) Illustrate the instrumental setup for EMG measurement. b) What are body plethysmographs	8 6	OCT 2023
4	a) Draw and explain the block diagram of an EEG machine. b) Explain any four respiratory parameters	8 6	OCT 2023
5	Explain any three respiratory parameters.	3	JUN 2023
6	Explain any three types of brain waves.	3	JUN 2023
7	Explain the working principle of an EMG system and list any two applications	7	JUN 2023
8	Illustrate how respiratory parameters are measured with a body plethysmograph	7	JUN 2023
9	With the necessary block schematic explain the principle of operation of a myoelectric-controlled prosthetic device	7	MODEL
10	List six applications of Functional electrical stimulation and explain one application in detail	7	MODEL

MODULE 4

Sl No	Question	Marks	KTU year
1	Explain the applications of telemetry in medicine	3	OCT 2023
2	Explain the working of a pH meter	3	OCT 2023
3	a) Explain the working of a blood cell counter b) What are pacemakers? Describe the working of pacemaker with diagram.	8,7 6,7	OCT 2023 JUN 2023
4	a) Illustrate the working of ventilator. b) Explain the working of defibrillator circuit diagram.	8 6,7	OCT 2023 JUN 2023
5	A person met with an accident and was taken to hospital with a bleeding deep wound. Suggest a suitable technique to stop the bleeding with utmost precision.	3	JUN 2023
6	Which medical instrument is used as a life saving equipment for persons with kidney failure. Explain the basic working of the instrument.	3	JUN 2023
7	With the help of a block diagram, explain the biomedical telemetry system	7	JUN 2023
8	What is diathermy? With a neat block schematic diagram, explain the working and applications of surgical diathermy equipment.	7	MODEL
9	What is dialysis? Explain any one type of dialyzer with the necessary	7	MODEL
10	With a neat block diagram explain single-channel ECG telemetry transmitter	7	MODEL

MODULE 5

Sl No	Question	Marks	KTU year
1	What are the advantages of CT imaging over X-ray imaging?	3	OCT 2023
2	Draw the block diagram of a NMR machine	3	OCT 2023
3	a) Explain the working principle of computed tomography (CT). With example explain how images are reconstructed in CT. b) Explain the principle behind ultra sonic imaging	9 5	OCT 2023
4	a) Explain the hazards caused to a human body on getting an electrical shock.	4 10	OCT 2023 JUN 2023

	b)Illustrate the working of X-ray imaging system.		
5	Explain the principle of ultrasound imaging.	3	JUN 2023
6	Explain the scanning system in a CT scanner.	3	JUN 2023
7	List the applications of X-rays in biomedical imaging.	4	JUN 2023
8	a)What are leakage currents. How are they classified	7	JUN 2023
	b)Explain the basic components associated with NMR imaging	7	
9	Explain how electric shock is hazardous to human body. What changes it will bring in the body, when the current increases.	6	MODEL
10	Explain the principle of basic pulse echo system with necessary diagrams.	7	MODEL