2021 BATCH QUESTION BANK
SEMESTER 8, 2024-2025

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QUESTIONS COMPILED BY

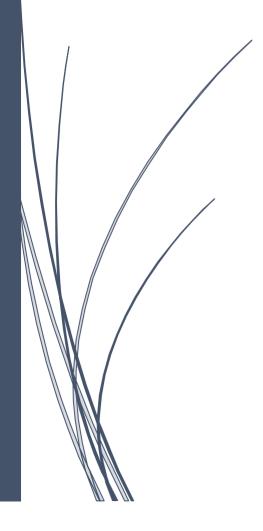**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

VIDYA ACADEMY OF SCIENCE & TECHNOLOGY TECHNICAL CAMPUS, KILIMANOOR

INDEX

ECT402

WIRELESS COMMUNICATION

Faculty–Ms. Bhagya Suresh

WIRELESSCOMMUNICATION(ECT402)

QUESTIONBANK

Qn. No	MODULE–1	Mark	Year
1	a. Enumerate the different features of a 4G mobile communication system.	7	June2023
		4	Model
	b. Give important features of 5G system.	3	Model
	c. List three differences between 2Gand3G systems.	4	Model
	d. Compare1G,2G,3G&4Gsystems.	7	Oct 2023
	e. Describe the features of the GSM system architecture with the help of a neat block diagram.		
2	a. What are the different standards used to implement the WirelessLocalAreaNetwork(WLAN)? Explain by comparing.	7	June2023
		7	July2021
		5	July2021
	b. DescribeWIMAXarchitecture.	7	Oct2019
	c. Mention the features of Bluetooth		
	d. Describe the role of Bluetooth technology in the development of personal area networks. What are the main features that distinguish Bluetooth from other wireless technologies?	5	AUG 2024
	e. Compare the wireless networksPANandWLAN.		
3	IfaSignaltoInterferenceRatio(SIR)of20dBisrequiredforsatisfactory forward channel performance of a cellular system, what isthe frequency reuse factor and cluster size that should be used formaximum capacity? The path loss exponent n=4. Assume there are 12co-channelcellsinfirsttierandallofthemareatthesamedistance frommobile.	7	June2023
4	Howdo co-channelinterference and adjacent channel interference Affect cellular system capacity?	7	June2023
5	a. What iscellsplitting?Howdoes it improve system performance?	7	Model
	b.Discussdifferenthandoffstrategies.	7	July2021
6	A total of 33MHz of bandwidth is allocated to an FDD cellular system whichusestwo25kHzsimplexchannelstoprovidefull-duplex voice&controlchannels.Computethenumberofchannelsavailablepercellifthes ystemuses 7-cellreuse.	7	Model
7	Explain channel assignments and handoff strategies in detail	10	May2019
8	Explain the different channel assignment strategies used in cellular system.	7	Oct2023

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	June2023
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	June2023
4	What is Fading? What are different types? What are the main factors affecting fading?	8	June2023
	Calculate the coherence time of a channel, if Doppler shift is produced due to the movement of a mobile with a velocity of 50m/ secand operating at1900MHz.	5	June2023
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	7	MODEL
	(b)Consider a flat-fading channel with iid channel gains g[i] which can take on values g1=0.05 with probability p1=0.1, g2=0.5 with probability p2=0.5, and g3=1 with probability p3=0.4. The transmit power is 10mW, noise spectral density N0=10-9W/Hz, and channel bandwidth is 30kHz. Assume instantaneous CSI-R, but transmitter does not have CSI Compute the capacity of the channel.	7	
7	Explain Free-Space Path Loss and derive the expression. Determine the path loss for a 3.4-GHz signal propagating 20,000m.	7	KTUSEP2020
8	Explain Ergodic capacity in detail.	5	Model
9	Derive the expression for the impulse response model of a multipath Channel	7	Oct2023
10	What is the received power in dBm for a freespace signal,whose transmit power is 1W and carrier frequency is 2.4GHz. If the receiver is at a distance of 1mile (1.6km)from the transmitter. What is the path loss in dB?	7	Oct2023
	Consider a wireless channel,where power falloff with distance Follows the formula Pr(d)=Pt(d0/d)3 for d0=50m.Assume the	7	Oct2023

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channelhasbandwidthB=50KHz andAWGN with noise PSDN0/2, WhereN0=109W/Hz. For a transmit power of 2W, find the capacity of this channel for a receive transmit distance of 200m and 1KM?What isyourconclusion?
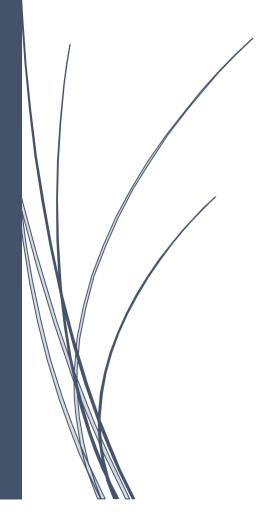
	MODULE3		
Sl.No.	**Questions**	**Marks**	**KTU,Year**
1	a.Derive expression for average probability of error in BPSK under Ray leigh flatfading, when the symbol duration is roughly equal to channel coherence time.	8	June2023
	b)How can the subcarrier fading be mitigated in multicarrier modulation system?	6	
2	a. With the help of neat block diagram explain Multicarrier modulation in OFDM transmitter and receiver section.	9	June2023
	b. List out the advantages and disadvantages of OFDM	5	
3	Whatis the purpose of using a cyclic prefix in an OFDM system?	3	MODEL
4	Define outage probability.	3	MODEL
5	What is Peak-to-AveragePower-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 than10-4.	5	MODEL
7	Under Rayleigh flat-fading, derive an expression for the required Average SNR to ensure that outage probability does not below Pout.	7	

	MODULEIV		
1	Why do we say that maximal ratio combining achieves full diversity?	7	MODEL
2	a. Derive the expression for the impulse response Heq(z), of a Minimum Mean Square Error (MMSE) equaliser.	7	June2023
	b. Compare Frequency Division Multiple Access(FDMA)andTime Division Multiple Access(TDMA) techniques.	7	June2023
3	a. Design a three tapzeroforcing equalizer with following parametersP(0)=1,P(-1)=0.3,P(-2)=-0.05,P(1)=0.2,P(2)=-0.06.	7	June2023
	b. Describe the principle of Selection Combining(SC) diversity technique.	7	
4	(a) Explain Least-Mean-Square algorithm for equalization. (b) Compute the average probability of bit error of BPSK under maximal-ratio combiningtwo-branch diversity with iidRayleighfading. Average SNRoneachbranchis10dB.	9 5	MODEL
5	Describe Almouti scheme for2x2MIMO.	7	June2023
6	Find the outage probability of BPSK modulationatPb=103 for a Rayleighfading channel with SC diversityforM=1(nodiversity) M=2.AssumeequalbranchSNRsof15dB.	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-tapZero-forcing equalizer for this channel	6	Model
9	Describe the working principle of aZero Forcing Equaliser with The help of a neat diagram.	7	OCT2023
10	Describe the steps to compute tap weights iteratively in LMS algorithm?	7	OCT2023
	MODULEV		
1	Distinguish between critical frequency and maximum usable	3	MODEL

	frequency.			
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.		7	June2023
	b. Analyze the effect of earth's magnetic field on radio wave propagation.		7	
4	a. A receiving antenna is located 60km from the transmitting antenna.The Height of the transmitting antenna is 100meters. What is therequired height of the receiving antenna. Consider effective radius ofearth.		7	June2023
	b. Derivetherelationbetweentheterms (i) CriticalFrequency (ii) SkipDistance (iii) MaximumUsableFrequency		7	
5	Describe Ground wavepropagation.		5	Model
6	a)Atelevision transmitter antenna mounted at a height of 200meters and the receiving antenna has a height of 20meters.What is the maximum spacing between the transmitter and receiver through tropospheric propagation? Also compute the radio horizon in this case.		7	OCT2023
			7	
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 is1.24x108electrons/cc?		8	Oct2023
			6	

ECT414

BIOMEDICAL ENGINEERING

Faculty–Ms. SUHA N.

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 corelate the signal with the working of the heart	3	JUN 2023

Sl No	Question	Marks	KTU year
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 atmost 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

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	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

ECT426

REAL TIME OPERATING SYSTEMS

Faculty–Ms. SOUMYA BABU H.

ECT 426 REAL TIME OPERATING SYSTEMS

Module 1

Sl No	Questions	Marks	KTU,Year
1	Explain the functions of an operating system	3	August 2024
2	Differentiate microkernel and exokernel structures of operating systems.	3	Model Question Paper
3 a	Explain the functions of operating system as viewed from the user side	7	August 2024 May 2023
b	Describe the structure of a Process Control Block	7	May 2024
4 a	Mention the importance of kernel in an operating system. Explain the main services offered by the kernel.	7	October 2023 June 2023
b	Draw the process state diagram and explain the different states	6	August 2024
5	Explain any three objectives of an operating system.	3	May 2024, 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 of operating systems in detail.	5 7 9	May 2024 June 2023 August 2024
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 user side	7 7	May 2024 June 2023

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		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	August 2024
3 a		Explain the Shortest Remaining Time First algorithm with a suitable example.	7	Model Question Paper
b		Schedule the given 5 processes with Round Robin scheduling.	7	Model Question Paper

Inner table for question 3b:

Process ID	Arrival Time	Burst Time
P1	0	5
P2	1	3
P3	2	1
P4	3	2
P5	4	3

Draw the Gantt chart and calculate the average waiting time and turn-around time for these processes if time quantum is 2 units

4		Describe the features of multilevel feedback queue scheduling algorithm.	3	May 2024 June 2023
5		List the problems associated with multi-process scheduling. How they can be solved?	3	June 2023
6		a) Differentiate process and thread in a system. Explain about multithreading models.	7	June 2023
		b) Explain the Shortest Remaining Time Next scheduling algorithm with an example.	7	
7		a) Illustrate the different levels of scheduling in a system with a neat diagram.	6	June 2023
		b) Schedule the following processes with SJF and Round Robin algorithms and compare their performances. Assume that all processes are arriving at time zero.	8	

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ProcessID	ArrivalTime	BurstTime
P1	2	10
P2	3	13
P3	1	20
P4	4	7

Module 3			
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. Explain how exceptions and interrupts helps in designing an embedded system.	7	June 2023
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

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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 CPU scheduling algorithm	8	May 2024
4 a	Explain the precedence constraints of a real time task.	6	May 2024
b	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 		C_i	T_i	 |---|---|---| | r_1	3	5	 | r_2	1	8	 | r_3	1	10	 Where Ci and Ti are the computation time activation period of the task.	7	Model Question Paper
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

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8	a) Draw the detailed process state transition diagram and explain each state.	9	June2023

Module 5			
Sl No	**Questions**	**Marks**	**KTU, Year**
1	List the features of Free RTOS.	4	August 2024 May 2024
2	Illustrate the threads in MicroC/OS-II operating system.	3	August 2024
3 a	Illustrate the implementation of a real time system with an example	7	August 2024
b	Explain the inter-process communication and synchronisation techniques used in Micro C/OS-II	7	August 2024
4 a	Compare the features of PSOS, VRTX and RT Linux 7	7	June 2023
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	June 2023 August 2024
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	August 2024 May 2024 June 2023
7	Compare the features of PSOS and VTRX.	3	June 2023
8	List the heap implementation schemes used in Free RTOS. Mention the functions of each.	3	June 2023

ECT458

INTERNET OF THINGS

Faculty–Ms. APSANA S.

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
	Explain physical design of IOT?	7	May 2024
	Explain what do you mean by logical design of IoT. What does it include?	5	Oct 2023
2	Explain the IoT enabling technologies	3	June 2023, May 2024
3	List different Cloud Deployment Models	3	June 2023
4	Explain the different characteristics of IOT?	3	May 2024, Oct 2023
	Define IoT. Explain the different characteristics of IoT.	7	June 2023
5	Explain different communication models used in IoT.	8	June 2023, May 2024
6	Explain with figure the architectural view of IoT	6	June 2023
7	List the different levels of IoT with an example	3	Oct 2023
	Explain the Levels of IoT with figure?	7	May 2024
	Explain with figure Level-5 IoT system. Give an example	7	June 2023
8	Explain with figure the IoT Functional blocks	6	Oct 2023
		7	May 2024
9	Explain the different protocols used in the link layer, network layer, transport layer and application layer protocols.	9	Oct 2023
	MODULE II		
1	Define Sensors, Actuators, and Smart Objects	3	June 2023
	Explain about sensors and actuators?	7	May 2024
2	List the differences between IoT and M2M.	3	June 2023, May 2024
	Explain the differences between IoT and M2M	8	Oct 2023
3	Why SDN is preferred rather than conventional network architectures?	3	June 2023
	Explain the issues of conventional networking architectures? How is it solved in SDN?	7	June 2023, May 2024
4	Define a smart object. Explain the four defining characteristics of a Smart Object	3	June 2023
	What are smart objects? What are their defining characteristics and the trends?	9	Oct 2023

5	Explain with figure Network Function Virtualization use case for IoT.	7	June 2023
6	Explain Network Function Virtualization for IoT.	6	Oct 2023
	Explain with figure network function virtualization use case for IoT	7	May 2024
7	Explain the characteristics and attributes to be considered when selecting and dealing with connecting smart objects.	8	Oct 2023
8	Explain Wireless Sensor Networks	6	Oct 2023
9	Explain in detail about WSN protocol?	7	May 2024
10	Explain the limitations of smart objects in WSNs.	5	Oct 2023
	Explain the wireless sensor network with block diagram?	3	May 2024

	MODULE III		
1	Explain the features of Modbus	3	June 2023
	What is Modbus? Give details?	3	May 2024
2	Explain the significance of 6LoWPAN Adaptation Layer	3	June 2023
	Give the overview of 6 LoW PAN adaptation layer	7	May 2024
3	Explain LoraWAN architecture and give detailed description on Physical Layer and MAC layer of LoraWAN architecture?	7,9	Oct 2023, May 2024
4	Explain ZigBee stack architecture.	3	Oct 2023
5	Explain the need for IP optimization in IoTs?	3	Oct 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.	8,9	June 2023, May 2024
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
	Explain detail about NB-IOT Network Laye	3	May 2024
	Explain in detail about NB-IoT Network Laye	7	May 2024
10	Explain how RPL provides the routing solution for IP smart objects in IoT	5	Oct 2023

	MODULE IV		
1	List different Cloud Deployment Models	3	June 2023
	Explain about various cloud deployment model	8	May 2024
2	Name any two cloud based platforms and give explanation	3	May 2024
	List any two cloud based platforms and give explanation	6	May 2024
	Explain the four service models of clouds	8	Oct 2023
3	Illustrate the data collections, storage and computing used in cloud platform	3	May 2024
4	What is an IoT Device? Give an example.	3	June 2023
	Explain an IoT Device. Draw basic building blocks of an IoT Device	7	June 2023
	Draw the Block diagram of an IoT Device	5	Oct 2023
	What is an IoT Device? Explain the basic building blocks of an IoT Device. Give examples.	9	Oct 2023, May 2024
5	Explain ZigBee stack architecture.	3	Oct 2023
6	Explain the need for IP optimization in IoTs?	3	Oct 2023
7	List the usages of virtualisation functions for data store, networks and servers	6	June 2023
8	Describe cloud computing service models in a software architectural concept, everything as a service	8	June 2023
9	Explain the features of Raspberry Pi	7	June 2023, May 2024
	List the reasons for employing Raspberry Pi as the development platform for IoT applications. Mention the main components of Raspberry Pi	6	Oct 2023

	MODULE V		
1	Define message integrity? How it is checked?	3	June 2023, May 2024
2	Explain about IoT vulnerabilities?	3	May 2024
	List the top l0 vlnerabilities for attack	6	May 2024
	List the top ten vulnerabilities for attack.	5	June 2023
3	Explain the three users that IoT applications must support through aggregated data in smart parking.	3	June 2023
4	What is security tomography? When is it useful?	3	Oct 2023
5	Explain briefly four-layered Smart City IoT Architecture	3	Oct 2023
	Explain with diagram 4layer smart city architecture?	8	May 2024
	Explain with diagram the 4-layer smart city architecture	8	Oct 2023
	Explain Smart City Security Architecture	6	Oct 2023
	Explain the IoT strategy for smarter cities	8	May 2024
6	Demonstrate a street light architecture in smart cities with the help of a diagram	6	May 2024
7	Explain the layered attacker model and possible attacks on the layers.	8	June 2023
8	Illustrate with figure the functions of a security function group in functional view of IoT reference architecture.	9	June 2023
9	Demonstrate street lighting architecture in smart cities with the help of a Diagram	6	Oct 2023
10	Explain with figure how air pollution monitoring system.	8	Oct 2023