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Periyanaickenpalayam, Coimbatore – 641020

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

QUESTION BANK

III YEAR

EVEN SEMESTER

ACADEMIC YEAR 2024 – 2025

INDEX

ET3491
EMBEDDED SYSYTEMS AND IOT DESIGN

UNIT I
8051 MICROCONTROLLER

Microcontrollers for an Embedded System – 8051 – Architecture – Addressing Modes – Instruction Set – Program and Data Memory – Stacks – Interrupts – Timers/Counters – Serial Ports – Programming

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What are the features of the 8051 microcontroller?	1	1	2
2.	Explain the different addressing modes of 8051.	1	2	2
3.	What is the purpose of the stack in the 8051 microcontroller?	1	1	2
4.	Describe the functions of interrupts in 8051.	1	1	2
5.	What are the timers and counters in 8051?	1	1	2
6.	Explain the instruction set of the 8051 microcontroller.	1	2	2
7.	Define the role of serial ports in 8051.	1	1	2
8.	How is memory organized in the 8051 microcontroller?	1	1	2
	PART B			
1.	Explain the architecture of the 8051 microcontroller in detail.	1	2	16
2.	Draw the pin configuration of 8051 and explain the function of each pin in detail.	1	2	16
3.	Explain in detail about various instruction set available in 8051 microcontroller.	1	2	16
4.	Explain the different addressing modes of 8051 in detail.	1	2	16

UNIT II

EMBEDDED SYSTEMS

Embedded System Design Process – Model Train Controller – ARM Processor – Instruction Set Preliminaries – CPU – Programming Input and Output – Supervisor Mode – Exceptions and Trap – Models for programs – Assembly, Linking and Loading – Compilation Techniques – Program Level Performance Analysis.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is an embedded system?	1	1	2
2.	Describe the basic components of an embedded system.	1	1	2
3.	Explain the role of ARM processors in embedded systems.	1	2	2
4.	What is the function of a supervisor mode in embedded systems?	1	1	2
5.	Define exceptions and traps in embedded systems.	1	1	2
6.	What are the compilation techniques used in embedded systems?	1	1	2
7.	Explain the task scheduling mechanism in embedded systems.	1	2	2
8.	Define program-level performance analysis.	1	1	2
	PART B			
1.	Explain the design process of an embedded system.	1	2	16
2.	Explain the ARM processor architecture and its importance in embedded system design.	1	2	16
3.	Classify the ARM instruction set and explain any one in detail.	1	2	16
4.	In Compilation process, explain the role of assemblers and linkers	1	2	16

UNIT III

PROCESSES AND OPERATING SYSTEMS

Structure of a real – time system – Task Assignment and Scheduling – Multiple Tasks and Multiple Processes – Multirate Systems – Pre emptive real – time Operating systems – Priority based scheduling – Interprocess Communication Mechanisms – Distributed Embedded Systems – MPSoCs and Shared Memory Multiprocessors – Design Example – Audio Player, Engine Control Unit and Video Accelerator.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is a real-time system?	1	1	2
2.	Define task assignment and scheduling in embedded systems.	1	1	2
3.	Explain the concept of multirate systems.	1	2	2
4.	What is priority-based scheduling?	1	1	2
5.	What is a preemptive real-time operating system?	1	1	2
6.	Define interprocess communication mechanisms.	1	1	2
7.	What are MPSoCs in embedded systems?	1	1	2
8.	Describe shared memory multiprocessors.	1	2	2
	PART B			
1.	Explain the structure and task scheduling of a real-time operating system.	1	2	16
2.	Discuss the design example of an audio player and video accelerator in embedded systems.	1	2	16
3.	(i) Explain in detail about the characteristics of distributed embedded system. (ii) Explain the architecture of distributed embedded system with neat sketch	1 1	2 2	8 8
4.	Explain the concept of multiprocessor system on chip (MPSoC) and shared memory multiprocessor are used in embedded applications.	1	2	16

UNIT IV

IOT ARCHITECTURE AND PROTOCOLS

Internet – of – Things – Physical Design, Logical Design – IoT Enabling Technologies – Domain Specific IoTs – IoT and M2M – IoT System Management with NETCONF – YANG – IoT Platform Design – Methodology – IoT Reference Model – Domain Model – Communication Model – IoT Reference Architecture – IoT Protocols - MQTT, XMPP, Modbus, CANBUS and BACNet.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What are the key components of an IoT system?	1	1	2
2.	Define IoT enabling technologies.	1	1	2
3.	What is the difference between IoT and M2M (Machine to Machine)?	1	1	2
4.	Explain IoT system management using NETCONF and YANG.	1	2	2
5.	What is the IoT reference model?	1	1	2
6.	Explain the communication model of IoT.	1	2	2
7.	What are IoT protocols such as MQTT and XMPP?	1	1	2
8.	Define Modbus and CANBUS protocols.	1	1	2
	PART B			
1.	Explain the IoT reference architecture and its layers.	1	2	16
2.	Briefly explain the technical building blocks of IoT	1	2	16
3.	Explain in detail about CANBUS and BACNet	1	2	16
4.	Explain in detail about IoT communication protocol.	1	2	16

UNIT V

IOT SYSTEM DESIGN

Basic building blocks of an IoT device – Raspberry Pi – Board – Linux on Raspberry Pi – Interfaces – Programming with Python – Case Studies: Home Automation, Smart Cities, Environment and Agriculture.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What are the basic building blocks of an IoT device?	1	1	2
2.	Explain the role of Raspberry Pi in IoT.	1	1	2
3.	Describe the function of Linux on Raspberry Pi.	1	1	2
4.	What are the common interfaces used in IoT devices?	1	2	2
5.	How is Python used for IoT programming?	1	1	2
6.	Discuss the application of IoT in home automation.	1	1	2
7.	What is the role of IoT in smart cities?	1	1	2
8.	Explain how IoT impacts environmental monitoring.	1	1	2
	PART B			
1.	Explain the architecture and programming of Raspberry Pi for IoT applications.	1	2	16
2.	Explain in detail about IoT based home automation.	1	2	16
3.	Explain in detail about IoT based Smart city.	1	2	16
4.	Explain in detail about IoT based Agriculture.	1	2	16

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CS3491
ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

UNIT I

PROBLEM SOLVING

Introduction to AI - AI Applications - Problem solving agents – search algorithms – uninformed search strategies – Heuristic search strategies – Local search and optimization problems – adversarial search – constraint satisfaction problems (CSP)

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is Artificial Intelligence?	1	1	2
2.	What are various applications of AI? or What can AI do today?	1	1	2
3.	What are the advantages of heuristic function?	1	1	2
4.	Is AI a science, or is it engineering? Or neither or both? Explain.	1	2	2
5.	How will you measure the problem-solving performance?	1	1	2
6.	State on which basis search algorithms are chosen?	1	1	2
7.	List some of the uninformed search techniques.	1	2	2
8.	What do you mean by local maxima with respect to search technique?	1	1	2
	PART B			
1.	Define the following problems. What types of control strategy is used in the following problem. i. The Tower of Hanoi ii. Crypto-arithmetic iii. The Missionaries and cannibals problems iv. 8-puzzle problem	1	4	16
2.	Explain the A* search and give the proof of optimality of A* Explain AO* algorithm with a suitable example. State the limitations in the algorithm?	1	4	8 8
3.	Explain the nature of heuristics with example. What is the effect of heuristics accuracy?	1	2	16
4.	Discuss about constraint satisfaction problem with a algorithm for solving a crypt arithmetic Problem. CROSS +ROADS ---------- DANGER ----------	1	2	16

UNIT II

PROBABILISTIC REASONING

Acting under uncertainty – Bayesian inference – naïve bayes models. Probabilistic reasoning – Bayesian networks – exact inference in BN – approximate inference in BN – causal networks.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Define principle of maximum expected utility (MEU)	2	1	2
2.	Mention the needs of probabilistic reasoning in AI.	2	1	2
3.	State Bayes' Theorem in Artificial Intelligence.	2	1	2
4.	What is Bayesian Belief Network?	2	1	2
5.	Given that P(A)=0.3,P(A|B)=0.4 and P(B)=0.5, Compute P(B|A).	2	2	2
6.	Differentiate uncertainty with ignorance	2	2	2
7.	What is the need for utility theory in uncertainty?	2	1	2
8.	Why does uncertainty arise?	2	2	2
	PART B			
1.	Explain variable elimination algorithm for answering queries on Bayesian networks?	2	4	16
2.	Construct a Bayesian Network and define the necessary CPTs for the given scenario. We have a bag of three biased coins a,b and c with probabilities of coming up heads of 20%, 60% and 80% respectively. One coin is drawn randomly from the bag (with equal likelihood of drawing each of the three coins) and then the coin is flipped three times to generate the outcomes X1, X2 and X3. a. Draw a Bayesian network corresponding to this setup and define the relevant CPTs. b. Calculate which coin is most likely to have been drawn if the flips come up HHT	2	4	8 8
3.	Discuss about Bayesian Theory and Bayesian network.	2	2	16
4.	Explain how does Bayesian statistics provide reasoning under various kinds of uncertainty?	2	2	16

UNIT III

SUPERVISED LEARNING

Introduction to machine learning – Linear Regression Models: Least squares, single & multiple variables, Bayesian linear regression, gradient descent, Linear Classification Models: Discriminant function – Probabilistic discriminative model - Logistic regression, Probabilistic generative model – Naive Bayes, Maximum margin classifier – Support vector machine, Decision Tree, Random forests.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is Machine Learning?	3	1	2
2.	What is 'Over fitting' in Machine learning?	3	1	2
3.	What are the different Algorithm techniques in Machine Learning?	3	1	2
4.	What is the main key difference between supervised and unsupervised machine learning?	3	2	2
5.	What is 'Training set' and 'Test set'?	3	1	2
6.	What is a Linear Regression?	3	1	2
7.	Why is random forest better than SVM?	3	2	2
8.	What is the difference between stochastic gradient descent (SGD) and gradient descent (GD)?	3	1	2
	PART B			
1.	Explain Naïve Bayes Classifier with an Example.	3	4	16
2.	Explain the following a) Linear regression b) Logistic Regression	3	4	8 8
3.	Explain SVM Algorithm in Detail. Explain Decision Tree Classification.	3	2	8 8
4.	Explain the principle of the gradient descent algorithm. Accompany your explanation with a diagram. Explain the use of all the terms and constants that you introduce and comment on the range of values that they can take.	3	2	16

UNIT IV

ENSEMBLE TECHNIQUES AND UNSUPERVISED LEARNING

Combining multiple learners: Model combination schemes, Voting, Ensemble Learning - bagging, boosting, stacking, Unsupervised learning: K-means, Instance Based Learning: KNN, Gaussian mixture models and Expectation maximization.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is bagging and boosting in ensemble learning?	4	1	2
2.	What type of classifiers are used in weighted voting method?	4	1	2
3.	What are examples of unsupervised learning?	4	1	2
4.	What are Gaussian mixture models How is expectation maximization used in it?	4	2	2
5.	What is the principle of maximum likelihood?	4	1	2
6.	What is expectation maximization algorithm used for?	4	1	2
7.	How do you implement expectation maximization algorithm?	4	2	2
8.	What is the advantage of Gaussian process?	4	1	2
	PART B			
1.	List the applications of clustering and identify advantages and disadvantages of clustering algorithm.	4	4	16
2.	Explain various learning techniques involved in unsupervised learning?	4	4	16
3.	What is Gaussian process? And explain in detail of Gaussian parameter estimates with suitable examples.	4	2	16
4.	List non-parametric techniques and Explain K-nearest neighbour estimation.	4	2	16

UNIT V
NEURAL NETWORKS

Perceptron - Multilayer perceptron, activation functions, network training – gradientdescent optimization – stochastic gradient descent, error backpropagation, from shallownetworks to deep networks –Unit saturation (aka the vanishing gradient problem) – ReLU,hyperparameter tuning, batch normalization, regularization, dropout.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is perceptron and its types?	5	1	2
2.	What are the advantages of Multilayer Perceptron?	5	1	2
3.	What are the three main types gradient descent algorithm?	5	1	2
4.	Does stochastic gradient descent lead to faster training?	5	2	2
5.	What are the types of activation function?	5	1	2
6.	Why is ReLU used in deep learning?	5	2	2
7.	Is stochastic gradient descent same as gradient descent?	5	2	2
8.	What are the activation functions of MLP?	5	1	2
	PART B			
1.	List the factors that affect the performance of multilayer feed-forward neural network. Difference between a Shallow Net & Deep Learning Net.	5	4	8 8
2.	Develop a Back propagation algorithm for Multilayer Feed forward neural network consisting of one input layer, one hidden layer and output layer from first principles.	5	4	16
3.	Draw the architecture of a Multilayer perceptron (MLP) and explain its operation. Mention its advantages and disadvantages.	5	5	16
4.	Write the flowchart of error back-propagation training algorithm.	5	5	16

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OEE351
RENEWABLE ENERGY SYSTEMS

UNIT I

INTRODUCTION

Primary energy sources, renewable vs. non-renewable primary energy sources, renewable energy resources in India, Current usage of renewable energy sources in India, future potential of renewable energy in power production and development of renewable energy technologies.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Differentiate Renewable and Non-Renewable Sources of energy.	1	4	2
2.	What are the limitations of renewable energy sources?	1	1	2
3.	What is energy conservation? Define energy efficiency.	1	1	2
4.	What are the three methods of conversion of solar energy into other useful forms of energy?	1	1	2
5.	What do you understand by energy resources?	1	1	2
6.	List the nonconventional energy sources. What is the status of non-conventional energy sources in India?	1	1	2
7.	Interpret primary and secondary sources with example	1	3	2
8.	List out the consequences of usage of fossil fuel for many application.	1	1	2
PART B				
1.	(i)Give brief review of various sources of renewable energy. Describe the energy scenario of India.	1	2	8
	(ii)Explain about the different types of Renewable energy sources.			8
2.	(i)Discuss the present status of world energy Scenario.	1	2	8
	(ii)Criticize the energy planning issues aiming to bridge the gap between the energy demand and supply situation in India.			8
3	Compare and Contrast Conventional energy sources & Renewable EnergySources.	1	4	16
4.	(i)Describe the various non-conventional energy resources available in India and its potential to supplement the conventional energy sources.	1	2	8
	(ii) What are the major difficulties in developing power using solar energy in India? Discuss the developments which have taken place during the last 10 years.			8

UNIT II

SOLAR ENERGY

Solar Radiation and its measurements, Solar Thermal Energy Conversion from plate Solar Collectors, Concentrating Collectors and its Types, Efficiency and performance of collectors, Direct Solar Electricity Conversion from Photovoltaic, types of solar cells and its application of battery charger, domestic lighting, street lighting, and water pumping, power generation schemes. Recent Advances in PV Applications: Building Integrated PV, Grid Connected PV Systems.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Mention the disadvantages of flat plate collectors.	2	1	2
2.	Distinguish between beam and diffuse radiation.	2	4	2
3.	Define the term solar cell and solar efficiency. Draw the equivalent circuit of a practical solar cell.	2	1	2
4.	What is the average range of solar radiation received on the earth's surface during day?	2	1	2
5.	How the collection of solar energy does is affected by tilting a flat plate collector with respect to ground?	2	1	2
6.	Mention any two applications of solar energy.	2	1	2
7.	What is the principle of photo voltaic?	2	1	2
8.	Enumerate the different types of concentrating type collectors.	2	4	2
	PART B			
1.	With the help of block diagrams explain the operations of stand-alone and grid interactive solar PV systems?	2	2	16
2.	Enumerate the different types of concentrating type collectors.	2	2	16
3	With the help of a neat sketch describe a solar heating system using water heating solar collectors. What are the advantages and disadvantages of this method?	2	2	16
4.	Write short notes on (a) Solar radiation (b) Power generation using solar tower concept.	2	1	8 8

UNIT III

WIND ENERGY

Wind energy principles, wind site and its resource assessment, wind assessment, Factors Influencing wind, wind turbine components, wind energy conversion systems (WECS), Classification of WECS devices, wind electric generating and control systems, characteristics and applications.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Mention the applications of Wind Energy.	3	2	2
2.	Outline the factors which determine the power in wind.	3	2	2
3.	Express the term cut in speed and cut out speeds for wind turbine. The power potential of a wind turbine at a wind speed of 5 m/s is 50 Kw. Find the power potential of the same turbine at a velocity of 8m/s.	3	3	2
4.	Define Vertical Axis Wind Turbine (VAWT)	3	1	2
5.	Enlist the advantages and disadvantages of wind energy.	3	1	2
6.	What are the most favourable sites for installing wind turbines?	3	1	2
7.	Define tip speed ratio.	3	1	2
8.	What is the condition for maximum output power from a wind turbine? Classify wind turbines by the orientation of their axis of rotation and by the mechanism that provides torque to the rotating shaft.	3	1	2
	PART B			
1.	(i)Explain briefly about the horizontal wind mills and vertical wind mills with neat sketch? (HAWT).	3	2	8
	(ii)Why is wind power not cost-competitive to conventional power systems? Describe oscillating water column technology of wave power conversion.			8
2.	(i) Describe with a neat sketch the working of a wind energy conversion system (WECS) with its main components.	3	2	8
	(ii) Discuss the various considerations taken into account for site selection of a wind energy system.			8

3	(i) Explain the peak power tracking scheme in WECS.	3	2	8
	(ii) Explain the working of grid tied WECS with neat diagram.			8
4.	(i)How energy from wind can be extracted? Explain the process by using suitable diagram.	3	2	8
	(ii)There are three sites with the following average wind power densities: Site A: 75 W/m2, site B: 500 W/m2, and site C: 800 W/m2. Do you recommend a wind turbine installation for all three sites? Explain.			8

UNIT IV

BIO-ENERGY

Energy from biomass, Principle of biomass conversion technologies/process and their Classification, Bio gas generation, types of biogas plants, selection of site for biogas plant, Classification of biogas plants, Advantage and disadvantages of biogas generation, thermal Gasification of biomass, biomass gasifiers, Application of biomass and biogas plants and their Economics.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Name any two factors to be considered for selection of site for a biogas plant.	4	1	2
2.	What are the factors that affect the generation of biogas?	4	1	2
3.	What is Biomass cogeneration? What are the sources of biomass energy?	4	1	2
4.	What are the different forms of biomass available as biofuels?	4	1	2
5.	What are bio-mass energy resources and what is energy yield from each of them?	4	1	2
6.	List out the characteristics of Biogas. Compare the heating value of biogas to that of natural gas. Which is higher?	4	1	2
7.	List down the various biomass conversion process.	4	1	2
8.	Enlist the advantages of anaerobic digestion.	4	1	2

PART B

1.	(i)Explain the biomass conversion technologies and explain any one in detail. (ii)Explain the process of commercial production of ethanol from biomass.	4	2	16
2.	Explain the working of fixed dome type biogas plant with the help of a neat sketch.	4	2	16
3	Write short notes on the following i) Source of biomass ii) Biomass energy	4	2	8 8
4.	(i)Explain any one type of gasifier with a neat line diagram. Mention the merits and demerits of the same. (ii) Describe in detail the various factors affecting bio digestion of a gas.	4	2	8 8

UNIT V

OTHER TYPES OF ENERGY

Energy conversion from Hydrogen and Fuel cells, Geo thermal energy Resources, types of wells, Methods of harnessing the energy, potential in India. OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini- hydel power plants and their economics.

Q.No	Question	CO	BTL	Marks

PART A

1.	Define hydrogen as a fuel. Why hydrogen is considered as a secondary energy source?	5	1	2
2.	List out the characteristics of geothermal energy.	5	1	2
3.	Justify, What are the special problems in construction of barriers for tidal scheme?	5	6	2
4.	List methods of Hydrogen Energy Storage.	5	2	2
5.	What is ocean thermal energy and how is it harnessed? What factors affect the surface water temperatures of oceans?	5	1	2
6.	Differentiate tide and wave.	5	4	2
7.	What are the limitations of harnessing wave energy?	5	1	2
8.	What is tidal energy? What are the two main technologies of wave energy conversion?	5	1	2

PART B

1.	(i)Explain the various principle of tidal steam generators.	5	2	8
	(ii)Explain with a neat sketch, the methods of operation of tidal power generation.			8
2.	What is geothermal energy? Explain the working principle of a geothermal power plant with the help of a neat sketch.	5	2	16
3	What are the main types of OTEC power plants? Describe their working in brief.	5	2	16
4.	Explain the working of tidal power plant with neat layout and specify the site requirements.	5	2	16

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CBM 368
THERAPEUTIC EQUIPMENT

UNIT I

CARDIAC & RESPIRATORY THERAPY EQUIPMENT

Cardiac Pacemaker: Internal and External Pacemaker Programmable pacemakers. Cardiac Defibrillators: AC and DC Defibrillator- Internal and External Defibrillators - Protection Circuit, Defibrillator analyzers. Cardiac ablation catheter. Types of Ventilators Pressure, Volume and Time controlled. Basic principles of electromechanical, pneumatic and electronic ventilators, Patient Cycle Ventilators, Ventilator testing. Humidifiers, Nebulizers, Inhalators

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is a (a) Defibrillator (b) Pacemaker (c) External pacemaker (d) Internal pacemaker (e) Cardiac/Catheter Ablation (f) Nebulizer	1	1	2
2.	What are the types of (a)pacemaker (b) defibrillators (c) cardiac ablation procedures.	1	1	2
3.	Explain the application of (a) ventricular asynchronous or stand by pacemaker (b) ventricular inhibited pacemaker (c) Atrial synchronous pacemaker.	1	1	2
4.	What are the components of pacemaker and list the specifications of the pacemaker?	1	1	2
5.	Calculate the energy stored in 16μF capacitor of a DC defibrillator that is charged to a potential of 5000 Vdc.	1	1	2
6.	What is (a) volume ventilator (b) pressure ventilator(c) volume cycled ventilator (d) pressure cycled ventilator (e) time cycled ventilator (f) Positive Pressure Ventilation (g) Negative Pressure Ventilation?	1	1	2
7.	What are the batteries used for implantable pacemaker?	1	1	2
8.	What is (a)Humidity (b)Humidification(c)Tidal Volume?	1	1	2
	PART B			
1.	Differentiate defibrillators and cardiac pacemakers.	1	4	16
2.	Discuss the types of cardiac pacemakers.	1	6	16
3.	Write a brief note on cardiac ablation catheter technique, defibrillators, ventilators, DC defibrillators, implantable defibrillators, programmable pacemakers.	1	2	16
4.	Describe in detail the different mechanical modes of operation of ventilator andcategorize the basic types of ventilators based on clinical usage in detail.	1	6	16

UNIT II
BIOMECHANICAL THERAPEUTIC EQUIPMENT

Electrodiagnosis, Therapeutic radiation, Electrotherapy, Electrodes, Stimulators for Nerve and Muscle, Functional Electrical Stimulation. peripheral nerve stimulator, ultrasonic stimulators, Stimulators for pain and relief - Inferential Therapy Unit, TENS. GAIT Assessment and Therapy. Continuous Passive Motion unit, Cervical / Lumber Traction Machine -Traction Table

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is a (a) Stimulator (b) Electrodiagnosis(c) Electrotherapy (d) FES technology (e) peripheral nerve stimulation (f) Continuous Passive Motion (CPM) therapy (g) traction table (h) GAIT (i) Ambulation?	2	1	2
2.	What is Electrotherapy used for?	2	1	2
3.	Define NMES.	2	1	2
4.	What is FES used for?	2	1	2
5.	What is the use of ultrasound?	2	1	2
6.	What is the function of ultrasound stimulators.	2	1	2
7.	What is the principle of IFT?	2	2	2
8.	What is (a) Cervical Traction (b) Lumbar Traction(c) TENS?	2	1	2
	PART B			
1.	Explain in detail about GAIT cycle, GAIT Assessment and Therapy.	2	5	16
2.	Discuss about muscle stimulators and its applications in medical field.	2	6	16
3.	What is Traction? Explain about types of traction.	2	5	16
4.	Write a brief note on (a) CPM-Continuous Passive Motion Unit (b) FES(c) Electrodiagnosis (d) Electrotherapy (e) NMES.	2	2	16

UNIT III

BODY CARE EQUIPMENT

Skin Treatment: Ultrasonic spot remove, vacuum therapy unit, Skin tightening, Wrinkle Reduction, Facial and Rejuvenation. Laser hair therapy machine. Body Slimmer/Shaper Deep Heat Therapy, Massager, Fitness Treadmill, Bike.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is the Ultrasonic Machine and how does it work?What are the main functions of the ultrasonic machine?	3	1	2
2.	What are all the reasons for premature ageing?	3	1	2
3.	What is Vacuum Therapy, mention its needs and benefits?	3	1	2
4.	What is meant by (a) skin tightening (b)Wrinkle reduction (c) Facial Rejuvenation (d) Deep heat therapy (e) massage therapy?	3	1	2
5.	What rejuvenation treatments are available at skin?	3	1	2
6.	What is LASER therapy and how does it work?	3	1	2
7.	What is physical fitness?	3	1	2
8.	What is a massager?	3	1	2
	PART B			
1.	Explain about laser hair therapy machine.	3	5	16
2.	Define deep heat therapy. Explain the process of this procedure in detail.	3	5	16
3.	Explain about massage and massager.	3	5	16
4.	Explain in detail about the following a. Treadmill b. Bike	3	5	16

UNIT IV

DENTAL CARE EQUIPMENT

Dental Chair - Dental Hand pieces and Accessories: Evolution of rotary equipment, Low-speed handpiece, High-speed handpiece, Hand piece maintenance. Vacuum and Pneumatic techniques: Vacuum techniques, Oral evacuation systems, Vacuum pump, Pneumatic techniques, Dental compressor. Decontamination Unit and constant fumigation unit. Dental Radiography: Dental X-ray Machine.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is a dental chair and list out its types?	4	1	2
2.	Give the significance of chair position& list the dental chair positions.	4	1	2
3.	Give the dental chair's optimum operating positions.	4	1	2
4.	What is a handpiece, dental hand piece and list the parts of dental hand piece.	4	1	2
5.	What is a (a) gear driven dental handpiece(b) water driven dental handpiece (c) belt driven dental handpiece (d) air driven dental handpiece?	4	1	2
6.	What is (a) straight handpiece (b) low speed handpiece (c) high speed handpiece (d) venture effect (e) autoclave?	4	1	2
7.	What is a Dental Compressor? How does it work?	4	1	2
8.	What is a dental vacuum pump and mention it's benefits?	4	1	2
	PART B			
1.	Explain in detail about dental chair and it's positions with necessary diagrams.	4	5	16
2.	Describe about the following (a) Low speed handpiece (b) High speed handpiece (c) Handpiece Maintenance.	4	6	16
3.	What is a vacuum pump? Explain the concept behind it.	4	5	16
4.	Describe in detail about (a) dental x-ray machine (b) oral evacuation system (c) dental compressor (d) Decontamination unit (e) Constant Fumigation	4	6	16

UNIT V

HEAT AND PHOTON THERAPY EQUIPMENT

High frequency heat therapy, Principle, Short wave diathermy, Microwave diathermy, Ultrasonic therapy, Lithotripsy. Therapeutic UV and IR Lamps. Basic principles of Biomedical LASERS: Applications of lasers in medicine, CO_2laser, He-Ne laser, Nd-YAG and Ruby laser.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is diathermy and how does it work, mention the benefits of diathermy?	5	1	2
2.	List the differences between SWD, MWD and USD.	5	1	2
3.	What is laser? What are the characteristics of Laser light?	5	1	2
4.	Distinguish between spontaneous and stimulated emission?	5	1	2
5.	What is Stimulated Emission, Spontaneous Emission, stimulated absorption, population inversion?	5	1	2
6.	What is meant by pumping? What are different methods of pumping?	5	1	2
7.	What are the conditions required for laser action?	5	1	2
8.	Define active medium.	5	1	2
9	What is meant by optical resonator (or) Resonance cavity?	5	1	2
10	Mention the medical applications of laser.	5	1	2
	PART B			
1.	Explain about the working of CO2 laser, Nd-YAG laser, Ruby laser, He-Ne laser.	5	5	16
2.	Explain in detail about (a) lithotripsy (b) ultrasonic therapy.	5	5	16
3.	Describe about SWD and it's types.	5	6	16
4.	Enumerate the concept behind UV and IR lamps.	5	5	16

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CEC348
REMOTE SENSING

UNIT I

REMOTE SENSING AND ELECTROMAGNETIC RADIATION

Definition – components of RS – History of Remote Sensing – Merits and demerits of Data Collation between conventional and remote sensing methods - Electromagnetic Spectrum – Radiation principles - Wave theory, Planck's law, Wien's Displacement Law, Stefan's Boltzmann law, Kirchoff's law – Radiation sources: active & passive – Radiation Quantities.

Q.No	Question	CO	BTL	M
	PART A			
1.	Define Remote sensing.	1	1	2
2.	List different EM regions with wavelength range.	1	1	2
3.	What is black body radiation?	1	1	2
4.	Define Wein's law or Planck's law or Stefan Boltzmann law.	1	1	2
5.	What is Electromagnetic spectrum?	1	1	2
6.	Difference between Conventional method and Remote sensing.	1	1	2
7.	Enlist the different types of Platforms that are used in remote sensing	1	1	2
8.	What are the applications of Remote ng?	1	1	2
	PART B			
1.	Bring out the inter relationship between wavelength, frequency,radient energy, temperature and radient emittance with appropriate formula.	1	4	16
2.	Explain the components of remote sensing with Sketch.	1	2	16
3.	Explain in detail about Active and Passive remote sensing interference.	1	2	16
4.	Explain the Electromagnetic spectrum with neat sketch for remote sensing data.	1	2	16

UNIT II

EMR INTERACTION WITH ATMOSPHERE AND EARTH MATERIAL

Standard atmospheric profile – main atmospheric regions and its characteristics – interaction of radiation with atmosphere – Scattering, absorption and refraction – Atmospheric windows – Energy balance equation – Specular and diffuse reflectors – Spectral reflectance & emittance– Spectroradiometer – Spectral Signature concepts – Typical spectral reflectance curves for vegetation, soil and water – solid surface scattering in microwave region.

Q.No	Question	CO	BTL	M
	PART A			
1.	Define Atmospheric window.	2	1	2
2.	When Mie scattering will occur in atmosphere?	2	1	2
3.	Draw a spectral signature curve for soil, water and vegetation.	2	1	2
4.	Define Energy balance equation.	2	1	2
5.	What is Specular Reflection?	2	1	2
6.	What is Diffuse Reflection?	2	1	2
7.	Define Spatial Resolution.	2	1	2
8.	What is Spectroradiometers and its applications?	2	1	2
	PART B			
1.	Explain in detail about main atmospheric regions and its characteristics.	2	2	16
2.	Enumerate the different atmospheric scattering and absorption mechanism. With a neat sketch of atmospheric window ,explain their importance in Remote sensing.	2	2	16
3.	Explain the Spectral reflectance characteristics for soil, water and vegetation.	2	2	16
4.	Explain the working principle of Spectroradiometer in remote sensing.	2	2	16

UNIT III

ORBITS AND PLATFORMS

Motions of planets and satellites – Newton ‘s law of gravitation – Gravitational field and potential - Escape velocity - Kepler ‘s law of planetary motion - Orbit elements and types – Orbital perturbations and maneuvers – Types of remote sensing platforms - Ground based, Air borne platforms and Space borne platforms – Classification of satellites – Sun synchronous and Geosynchronous satellites – Legrange Orbit

Q.No	Question	CO	BTL	M
	PART A			
1.	Differentiate between sun synchronous satellite and geo synchronous satellite.	3	1	2
2.	Define Escape velocity.	3	1	2
3.	Define Kepler’s law.	3	1	2
4.	What are the types of remote sensing platforms?	3	1	2
5.	Define Legrange orbit.	3	1	2
6.	Define GEO satellite.	3	1	2
7.	What is Prograde orbit?	3	1	2
8.	Define Argument of Perigee.	3	1	2
	PART B			
1.	Discuss the various remote sensing platforms.	3	2	16
2.	Explain the types of satellites and also in its functions in remote sensing.	3	2	16
3.	Derive the expression between Gravitational field and Potential.	3	2	16
4.	Explain in detail about Orbital elements and Orbital Perturbations.	3	2	16

UNIT IV

SENSING TECHNIQUES

Classification of remote sensors – Resolution concept: spatial, spectral, radiometric and temporal resolutions - Scanners - Along and across track scanners – Optical-infrared sensors – Thermal sensors – microwave sensors – Calibration of sensors – High Resolution Sensors - LIDAR, UAV – Orbital and sensor characteristics of live Indian earth observation satellites.

Q.No	Question	CO	BTL	M
	PART A			
1.	Why we need multispectral image?	4	1	2
2.	List any four satellite sensors with spatial resolution.	4	1	2
3.	Define LIDAR and UAV.	4	1	2
4.	Define swath.	4	1	2
5.	Define Scanners.	4	1	2
6.	Define Microwave Sensors.	4	1	2
7.	Explain the functionality of Infrared sensors.	4	2	2
8.	List the characteristics of sensors.	4	1	2
	PART B			
1.	Describe the resolution concepts of satellite sensors.	4	2	16
2.	Explain scanners in satellite sensors.	4	2	16
3.	Explain the principles and applications of microwave remote sensing.	4	2	16
4.	Write the applications of Thermal infrared sensors.	4	1	16

UNIT V

DATA PRODUCTS AND INTERPRETATION

Photographic and digital products – Types, levels and open-source satellite data products - selection and procurement of data – Visual interpretation: basic elements and interpretation keys Digital interpretation – Concepts of Image rectification, Image enhancement and Imag classification.

Q.No	Question	CO	BTL	M
	PART A			
1.	What is the advantage of Unsupervised Classification?	5	1	2
2.	What are the types of data products?	5	1	2
3.	What are the types of Data format?	5	1	2
4.	Write any four visual interpretation key elements.	5	1	2
5.	What is Image Enhancement?	5	1	2
6.	Difference between supervised and unsupervised classifications.	5	1	2
7.	Define Digital image processing.	5	1	2
8.	State the significance of vegetation indices in image analysis.	5	1	2
	PART B			
1.	Write the guidelines to order satellite data products.	5	2	16
2.	Explain the basic elements of interpretation with examples.	5	2	16
3.	Explain in detail about the types of data products.	5	2	16
4.	Write an essay on Supervised and unsupervised classification of remote sensing data.	5	2	16

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CEC364
WIRELESS BROADBAND NETWORKS

UNIT I

WIRELESS PROTOCOLS

Mobile network layer- Fundamentals of Mobile IP, data forwarding procedures in mobile IP, IPv4, IPv6, IP mobility management, IP addressing - DHCP, Mobile transport layer-Traditional TCP, congestion control, slow start, fast recovery/fast retransmission, classical TCP improvements- Indirect TCP, snooping TCP, Mobile TCP.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Define Mobile IP.	1	1	2
2.	What are the key components of a Mobile IP network?	1	1	2
3.	List the advantages of IPv6 over IPv4.	1	1	2
4.	What is the purpose of DHCP in IP addressing?	1	1	2
5.	Explain the role of a Home Agent (HA) in Mobile IP.	1	2	2
6.	How does Mobile IP support seamless mobility?.	1	2	2
7.	Differentiate between Traditional TCP and Mobile TCP.	1	2	2
8.	Why is congestion control necessary in TCP?	1	2	2
	PART B			
1.	Explain the fundamentals of Mobile IP and describe the data forwarding procedures in Mobile IP.	1	2	16
2.	Analyze the differences between IPv4 and IPv6 addressing and discuss the role of DHCP in IP addressing.	1	4	16
3.	Illustrate the congestion control mechanisms in TCP, including slow start, fast retransmission, and fast recovery.	1	3	16
4.	Evaluate the various classical TCP improvements such as Indirect TCP, Snooping TCP, and Mobile TCP, and justify their effectiveness in wireless networks.	1	5	16

UNIT II

3G EVOLUTION

IMT-2000 - W-CDMA, CDMA 2000 - radio & network components, network structure, packet-data transport process flow, Channel Allocation, core network, interference-mitigation techniques, UMTS-services, air interface, network architecture of 3GPP, UTRAN – architecture, High Speed Packet Data-HSDPA, HSUPA.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is IMT-2000?	2	1	2
2.	List any two differences between W-CDMA and CDMA 2000.	2	1	2
3.	Define Channel Allocation in 3G networks.	2	1	2
4.	What are the key components of a 3G core network?	2	2	2
5.	Explain the role of UTRAN in 3G networks.	2	2	2
6.	What is HSDPA? Mention its significance in 3G networks.	2	2	2
7.	Describe the function of the air interface in UMTS.	2	2	2
8.	How does interference mitigation improve 3G network performance?	2	2	2
	PART B			
1.	Explain the architecture of the 3GPP network and describe its key components.	2	3	16
2.	Compare and contrast W-CDMA and CDMA 2000 in terms of network structure, channel allocation, and data transmission.	2	4	16
3.	Discuss the working process of High-Speed Packet Data technologies (HSDPA & HSUPA) and their impact on data transmission in 3G networks.	2	5	16
4.	Propose interference-mitigation techniques for 3G networks and justify their effectiveness in real-time scenarios.	2	6	16

UNIT III

4G EVOLUTION

Introduction to LTE-A – Requirements and Challenges, network architectures – EPC, E- UTRAN architecture - mobility management, resource management, services, channel -logical and transport channel mapping, downlink/uplink data transfer, MAC control element, PDU packet formats, scheduling services, random access procedure.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What does LTE-A stand for, and how does it differ from LTE?	3	1	2
2.	List any two challenges in the evolution of LTE-Advanced.	3	1	2
3.	What is the function of the EPC in LTE-A?	3	1	2
4.	Define Mobility Management in LTE networks.	3	1	2
5.	Explain the role of MAC control elements in LTE-A.	3	2	2
6.	Differentiate between logical and transport channels in LTE.	3	2	2
7.	What is the significance of the random access procedure in LTE?	3	2	2
8.	How does scheduling services improve resource management in LTE-A?	3	2	2
	PART B			
1.	Explain the LTE-A network architecture, including EPC and E-UTRAN, with a neat diagram.	3	2	16
2.	Describe the downlink and uplink data transfer process in LTE-A, focusing on channel mapping and MAC PDU formats.	3	2	16
3.	Analyze the challenges in mobility and resource management in LTE-A and propose solutions to improve network efficiency.	3	2	16
4.	Compare and contrast LTE and LTE-A in terms of performance, channel structure, and service enhancements.	3	2	16

UNIT IV

LAYER-LEVEL FUNCTIONS

Characteristics of wireless channels - downlink physical layer, uplink physical layer, MAC scheme - frame structure, resource structure, mapping, synchronization, reference signals and channel estimation, SC-FDMA, interference cancellation–COMP, Carrier aggregation, Services -multimedia broadcast/multicast, location-based services.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What are the main characteristics of wireless channels?	4	1	2
2.	Define SC-FDMA and its significance in uplink transmission.	4	1	2
3.	What is the function of reference signals in LTE?	4	1	2
4.	List any two advantages of carrier aggregation in LTE-A.	4	1	2
5.	Explain the role of synchronization in the LTE frame structure.	4	2	2
6.	Differentiate between downlink and uplink physical layers in LTE-A.	4	2	2
7.	What is Coordinated Multi-Point (CoMP), and how does it help in interference cancellation?	4	2	2
8.	How do location-based services work in LTE-A?	4	2	2
	PART B			
1.	Explain the LTE frame structure, including resource allocation, synchronization, and mapping techniques.	4	3	16
2.	Explain the LTE frame structure, including resource allocation, synchronization, and mapping techniques.	4	3	16
3.	Analyze the impact of interference in LTE-A networks and discuss how CoMP and interference cancellation techniques improve performance.	4	4	16
4.	Compare and contrast multimedia broadcast/multicast services with traditional unicast services in LTE-A.	4	4	16

UNIT V

5G EVOLUTION

5G Roadmap - Pillars of 5G - 5G Architecture, The 5G internet - IoT and context awareness - Networking reconfiguration and virtualization support - Mobility QoS control - emerging approach for resource over provisioning, Small cells for 5G mobile networks- capacity limits and achievable gains with densification - Mobile data demand, Demand Vs Capacity, Small cell challenges, conclusion and future directions.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What are the key pillars of 5G technology?	5	1	2
2.	Define network virtualization in the context of 5G.	5	1	2
3.	What is the role of small cells in 5G networks?	5	1	2
4.	List any two challenges in small cell deployment for 5G.	5	1	2
5.	Explain the concept of IoT in 5G networks.?	5	2	2
6.	How does mobility QoS control enhance user experience in 5G?	5	2	2
7.	Define non-invasive and invasive attacks	5	2	2
8.	What is resource over-provisioning in 5G, and why is it important?	5	2	2
	PART B			
1.	Explain the 5G architecture and its key components with a suitable diagram.	5	3	16
2.	Discuss the role of networking reconfiguration and virtualization in 5G, highlighting its impact on performance.	5	3	16
3.	Analyse the impact of small cells on 5G network capacity and the challenges associated with their deployment.	5	4	16
4.	Compare and contrast mobile data demand vs. capacity in 5G networks and suggest possible solutions for capacity enhancement.	5	4	16

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MX3085

WELL-BEING WITH TRADITIONAL PRACTICES-YOGA, AYURVEDA AND SIDDHA

UNIT I

HEALTH AND ITS IMPORTANCE

Health: Definition - Importance of maintaining health - More importance on prevention than treatment Ten types of health one has to maintain - Physical health - Mental health - Social health - Financial health - Emotional health - Spiritual health - Intellectual health - Relationship health - Environmental health - Occupational/Professional heath. Present health status - The life expectancy-present status - mortality rate - dreadful diseases - Non-communicable diseases (NCDs) the leading cause of death - 60% - heart disease – cancer – diabetes - chronic pulmonary diseases - risk factors – tobacco – alcohol - unhealthy diet - lack of physical activities. Types of diseases and disorders - Lifestyle disorders – Obesity – Diabetes - Cardiovascular diseases – Cancer – Strokes – COPD - Arthritis - Mental health issues. Causes of the above diseases / disorders - Importance of prevention of illness - Takes care of health - Improves quality of life - Reduces absenteeism - Increase satisfaction - Saves time Simple lifestyle modifications to maintain health - Healthy Eating habits (Balanced diet according to age) Physical Activities (Stretching exercise, aerobics, resisting exercise) - Maintaining BMI-Importance and actions to be taken

Q.No	Question	CO	BTL	Marks
	PART A			
1.	What is a. physical health b. mental health c. social health d. financial health e. Emotional health	**1**	**1**	**2**
2.	What is a. Spiritual health b. Intellectual health c. Relationship health d. Environmental health e. Occupational/Professional health.	**1**	**1**	**2**
3.	Explain in short the various factors leading to present health status.	**1**	**1**	**2**
4.	Write the various types of diseases and disorders.	**1**	**1**	**2**
5.	Write about the healthy eating habits.	**1**	**1**	**2**
6.	Give an account of causes of diseases/ disorders.	**1**	**1**	**2**
7.	Write about the preventive measures of diseases/ disorders.	**1**	**1**	**2**
8.	What aresimple lifestyle modifications to maintain health?	**1**	**1**	**2**

PART B

1.	Explain the types of health one has to maintain.	**1**	**5**	**16**
2.	Explain in detail present health status.	**1**	**5**	**16**
3.	Discuss the types of diseases, disorders, causes and preventive measures.	**1**	**6**	**16**
4.	Describe in detail the simple lifestyle modifications to maintain health.	**1**	**6**	**16**

UNIT II

DIET

Role of diet in maintaining health - energy one needs to keep active throughout the day - nutrients one needs for growth and repair - helps one to stay strong and healthy - helps to prevent diet-related illness, such as some cancers - keeps active and - helps one to maintain a healthy weight - helps to reduce risk of developing lifestyle disorders like diabetes – arthritis – hypertension – PCOD – infertility – ADHD – sleeplessness -helps to reduce the risk of heart diseases - keeps the teeth and bones strong. Balanced Diet and its 7 Components - Carbohydrates – Proteins – Fats – Vitamins – Minerals - Fibre and Water. Food additives and their merits & demerits - Effects of food additives - Types of food additives - Food additives and processed foods - Food additives and their reactions Definition of BMI and maintaining it with diet Importance - Consequences of not maintaining BMI - different steps to maintain optimal BM Common cooking mistakes Different cooking methods, merits and demerits of each method

Q.No	Question	CO	BTL	Marks

PART A

1.	What is the Role of diet in maintaining health?	**2**	**1**	**2**
2.	What is Balanced Diet and its 7 Components?	**2**	**1**	**2**
3.	Define Food additives.	**2**	**1**	**2**
4.	What are the merits and demerits of food additives?	**2**	**1**	**2**
5.	Give the definition of BMI.	**2**	**1**	**2**
6.	How to maintain BMI with diet?	**2**	**1**	**2**

7.	What are the various cooking methods?	**2**	**1**	**2**
8.	What are the demerits of different cooking methods?	**2**	**1**	**2**

PART B

1.	Explain in detail about the Role of diet in maintaining health.	**2**	**5**	**16**
2.	Discuss about the Balanced Diet and its Components.	**2**	**6**	**16**
3.	What are Food additives? Explain the merits and demerits of food additives	**2**	**5**	**16**
4.	Write a brief note on a. maintaining BMI with diet b. merits and demerits of different cooking methods	**2**	**2**	**16**

UNIT III

ROLE OF AYURVEDA & SIDDHA SYSTEMS IN MAINTAINING HEALTH

AYUSH systems and their role in maintaining health - preventive aspect of AYUSH - AYUSH as a soft therapy. Secrets of traditional healthy living - Traditional Diet and Nutrition - Regimen of Personal and Social Hygiene - Daily routine (Dinacharya) - Seasonal regimens (Ritucharya) - basic sanitation and healthy living environment - Sadvritta (good conduct) - for conducive social life. Principles of Siddha & Ayurveda systems - Macrocosm and Microcosm theory - Pancheekarana Theory / (Five Element Theory) 96 fundamental Principles - UyirThathukkal (Tri-Dosha Theory) - Udal Thathukkal Prevention of illness with our traditional system of medicine Primary Prevention - To decrease the number of new cases of a disorder or illness - Health promotion/education, and - Specific protective measures - Secondary Prevention - To lower the rate of established cases of a disorder or illness in the population (prevalence) - Tertiary Prevention - To decrease the amount of disability associated with an existing disorder.

Q.No	Question	CO	BTL	Marks

PART A

1.	Mention the AYUSH systems and their role in maintaining health?	**3**	**1**	**2**
2.	What are the secrets of traditional healthy living?	**3**	**1**	**2**
3.	Mention the principles of siddha systems.	**3**	**1**	**2**
4.	Mention the principles ofAyurveda systems.	**3**	**1**	**2**
5.	What are the primary prevention techniques for illness with our traditional	**3**	**1**	**2**

	system of medicine?			
6.	What are the secondary prevention techniques for illness with our traditional system of medicine?	**3**	**1**	**2**
7.	What are the tertiary prevention techniques for illness with our traditional system of medicine?	**3**	**1**	**2**
8.	Mention about 96 fundamental Principles.	**3**	**1**	**2**

PART B

1.	Explain in detail about Secrets of traditional healthy living.	**3**	**5**	**16**
2.	Explain in detail about principles of Siddha & Ayurveda systems.	**3**	**5**	**16**
3.	Explain about the prevention of illness with our traditional system of medicine	**3**	**5**	**16**
4.	Explain in detail about the AYUSH systems and their role in maintaining health	**3**	**5**	**16**

UNIT IV

MENTAL WELLNESS

Emotional health - Definition and types - Three key elements: the subjective experience - the physiological response - the behavioral response - Importance of maintaining emotional health - Role of emotions in daily life -Short term and long term effects of emotional disturbances - Leading a healthy life with emotions - Practices for emotional health - Recognize how thoughts influence emotions - Cultivate positive thoughts - Practice self-compassion - Expressing a full range of emotions.Stress management - Stress definition - Stress in daily life - How stress affects one's life - Identifying the cause of stress - Symptoms of stress - Managing stress (habits, tools, training, professional help) - Complications of stress mismanagement. Sleep - Sleep and its importance for mental wellness - Sleep and digestion. Immunity - Types and importance - Ways to develop immunity

Q.No	Question	CO	BTL	Marks
	PART A			
1.	Define Emotional health?	**4**	**1**	**2**
2.	Give the significance of maintaining emotional health	**4**	**1**	**2**
3.	Give the Role of emotions in daily life.	**4**	**1**	**2**
4.	What is Short term and long term effects of emotional disturbances.	**4**	**1**	**2**
5.	Explain how stress affects one's life?	**4**	**1**	**2**
6.	Give the account on Sleep and its importance for mental wellness?	**4**	**1**	**2**
7.	Mention the ways to develop immunity.	**4**	**1**	**2**
8.	What are the symptoms of stress and it's Management?	**4**	**1**	**2**
	PART B			
1.	Explain in detail about definition and types of Emotional health.	**4**	**5**	**16**
2.	Describe about Stress management.	**4**	**6**	**16**
3.	Explain in detail about sleep and its importance for mental wellness.	**4**	**5**	**16**
4.	Describe in detail about types and importance of immunity.	**4**	**6**	**16**

UNIT V

YOGA

Definition and importance of yoga - Types of yoga - How to Choose the Right Kind for individuals according to their age - The Eight Limbs of Yoga - Simple yogasanas for cure and prevention of health disorders - What yoga can bring to our life.

Q.No	Question	CO	BTL	Marks
	PART A			
1.	How to choose the right kind of yoga for individuals according to their age?	**5**	**1**	**2**
2.	List the types of yoga.	**5**	**1**	**2**
3.	Give an account the eight limbs of yoga?	**5**	**1**	**2**
4.	Give the simple yogasanas for cure of health disorders.	**5**	**1**	**2**

5.	Give the simple yogasanas for prevention of health disorders.	**5**	**1**	**2**
6.	What yoga can bring to our life?	**5**	**1**	**2**
7.	Give the importance of yoga.	**5**	**1**	**2**
8.	Define yoga.	**5**	**1**	**2**

PART B

1.	Explain about the Types of yoga.	**5**	**5**	**16**
2.	Explain in detail about the simple yogasanas for cure and prevention of health disorders.	**5**	**5**	**16**
3.	What yoga can bring to our life? Explain.	**5**	**5**	**16**
4.	Explain how to Choose the Right Kind for individuals according to their age.	**5**	**5**	**16**

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