MOJOR – 1 QUESTION BANK

Govt (A) College

Essentials - Mathematics

Question Bank.

Essays:-

1. If $x+iy = \frac{1}{1+\cos\theta+i\sin\theta}$ Then Show that

$4x^2-1=0$.

2. If The points whose position vectors are $3\bar{i}-2\bar{j}-\bar{k}$, $2\bar{i}+3\bar{j}-4\bar{k}$, $-\bar{i}+\bar{j}+2\bar{k}$, $4\bar{i}+5\bar{j}+\lambda\bar{k}$ are coplanar Then Show that $\lambda = \frac{-146}{17}$

3. Find The Mean of The following distribution

C.I	60-62	63-65	66-68	69-71	72-74
frequency	15	118	142	127	18.

V.S.Q's

1. find $\sin\check{}60^\circ + \cos\check{}60^\circ$
2. If $\sec\theta+\tan\theta=5$, Then find $\sec\theta-\tan\theta$
3. Find the multiplicative Inverse of $3-5i$
4. find $\cos 42 + \cos 78^\circ + \cos 162$
5. find The Mean of 40, 50, 45, 35, 25
6. Find The Median of 11, 15, 16, 14, 11, 13, 12, 14, 15, 16
7. find The Mode of 1, 2, 3, 4, 4, 4, 5, 6, 7, 4
8. Write The formulae for median grouped data
9. If The vectors $2\bar{i}+\lambda\bar{j}-\bar{k}$ and $4\bar{i}-2\bar{j}+2\bar{k}$

are perpendicular To Each other find The value of λ.

10. If $4\bar{i} + \frac{2p}{3}\bar{j} + p\bar{k}$ is parallel To the vector $\bar{i} + 2\bar{j} + 3\bar{k}$, find The value of "p"

I Matching:

1. $\sin 60°$	( )	a)	$\frac{1-\tan^2 A}{1+\tan^2 A}$
2. $\tan 90°$	( )	(b)	$\frac{2\tan A}{1+\tan^2 A}$
3. $\sin 2A$	( )	(c)	$\frac{1}{2}$
4. $\cos 2A$	( )	(d)	∞
		(e)	$\frac{\sqrt{3}}{2}$

II

1. $2+\sqrt{5}i$ additive Inverse	( )	(a)	30
2. $3+4i$ Conjugate complex	( )	(b)	4
3. The mode of 1, 4, 5, 4, 4, 6, 4, 4, 1	( )	(c)	$-2-\sqrt{5}i$
4. The mean of 30, 40, 20, 10, 50	( )	(d)	$3-4i$
		(e)	$2-\sqrt{5}i$

Application of maths

1. prove That (i) $\sin A \sin(60+A)\sin(60-A) = \frac{1}{4}\sin 3A$ and hence deduce That $\sin\frac{\pi}{9}\cdot\sin\frac{2\pi}{9}\sin\frac{3\pi}{9}\sin\frac{4\pi}{9} = \frac{3}{16}$

2. find The mode for The following data

C.I	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	5	8	7	12	28	20	10	10

PHYSICS Unit-2

Section A

Essay type answer Questions

1. State and explain Newton's Laws of motion
2. Explain about laws of thermodynamics and their significance
3. Explain various theories in understanding of Universe

Section B

One Sentence answer type Questions

1. What are the basic units?
2. Write two main domains of physics
3. State first law of thermodynamics
4. Give significance of 2^{nd} law of thermodynamics
5. Write failures of Newtonian Mechanics
6. Write a short note on Relativistic Mechanics
7. What are acoustic waves?
8. What are electromagnetic waves?
9. Define electromagnetic induction
10. State uncertainty principle

Section C

Match the following

Column 1	Column 2
1. Energy	( ) a. Quantum Mechanics
2. Microscopic domain	( ) b . Generator
3. Second Law of Thermodynamics	( ) c. Joul
4. Electro-Magnetic Induction	( ) d. Refrigerator

	Column 1		Column 2
5.	Electron	( )	a. smallest unit of matter
6.	Proton	( )	b. Negative
7.	Neutron	( )	c. Neutral
8.	Atom as a whole	( )	d. Positive

Unit-4

SECTION-A

1. How physics helps in environmental monitoring?

2. Write the applications of chemistry in Material Science.

SECTION-B

1. Integrated circuit industry is mainly based on which the principles ?
   Ans: Solid state Physics
2. Development of high-performance electronic components and Nano scale devices requires the essential knowledge on_____(Quantum Mechanics)
3. Which principles help in designing robots with the desired range of motion, speed, and accuracy?(Kinematics and Dynamics)
4. An Application of Physics in automotive industry is_____ (Braking systems for improved stability, handling, and safety)
5. An Application of Physics in aerospace industry is_____(To design aircraft that can take off, maneuver, and land safely and efficiently.)
6. Write two types of calculus.

   Ans:1. Differential Calculus 2. Integral Calculus
7. If we take the derivative of a function and then take the integral of it, we get_____(The same given function)

8. Give one physics problem that involves the application of differential equations

   Ans: Newton's laws of motions and laws of thermodynamics
9. Give two application of chemistry in material science

   Ans: To synthesis and fabricate various new materials and Material design and modifications
10. Write one application of complex analysis

    Ans:To analyze sound waves in in speech recogniti

Unit III
Chemistry

Essays

1.what are the branches in chemistry & give its significance.

2.Define Carbohydrate & explain its classification.

VSAQs

1. Give an example for physical change & chemical change.
2. What are Write the Electronic configuration of chromium.
3. What are water soluble & fat soluble vitamins.
4. Write any two functions of proteins.
5. Define Homogeneous & Heterogeneous mixtures.
6. Write the Structure of glucose.
7. What are Disaccharides.
8. What is peptide bond.
9. Write a note on vitamin B12.
10. Write a note on vitamin K.
11. Write any two application of food and beverages industries.
12. Write any two application of medicinal chemistry.

Column I	Column II	
i). Proteins	a. Monosaccharides	(d)
ii). Carbohydrates	b. Triglycerides	(a)
iii). Lipids	c. Nucleotides	(b)
iv). Nucleic acids	d. Amino acids	(c)
V) vitamin B1	e. thiamine	(e)

2. Match the following

Column I	Column II
(A) Vitamin B_1	(i) Convulsions
(B) Vitamin B_2	(ii) Pernicious anaemia
(C) Vitamin B_{12}	(iii) Beri beri
(D) Vitamin B_6	(iv) Cheilosis
(E) Vitamin E	v) anemia

A

(A) → (iv), (B) → (iii), (C) → (i), (D) → (ii) ,E) V

Major 1 : Computers

Essay answer questions

1. Explain milestones of computer evolution
2. Explain the types of networks
3. Explain the basics of cryptography including the differences between symmetric and asymmetric encryption.

One Word Question &Answers

1. what is VLSI ?
2. what is two example of 3rd generation of computer?
3. what is TCP ?
4. ICMP is used for communication
5. What is encryption?
6. what is firewalls
7. what is VPN
8. what type of firewall operates as an intermediary between two systems?
9. what is the system that translates human-readable domain names into numerical IP addresses?
10. What is IP address?

Match The Following:

Matching - I

1. First Generation	(d)	a. Artificial Intelligence
2. Second Generation	(c)	b. Magnetic Tapes
3.Third Generation	(b)	c. Punched Cards
4.Fourth Generation	(e)	d. Machine Language
5.Fifth Generation	(a)	e. Microprocessor

Matching – II

1. TCP	(b)	a. Dynamic Host Control Protocol
2. VPN	(d)	b. Transmission Control Protocol
3. DHCP	(a)	c. User Datagram Protocol
4. UDP	(c)	d. Virtual Private Network

GOVERNMENT COLLEGE (A) , RAJAHMUNDRY
PAPER;M : ADVANCES IN MATEMATICAL, PHYSICAL AND CHEMICAL SCIENCE
QUESTION BANK
PHYSICS Unit-2
Section A

Advances – Maths

Question – Bank.

Essays:-

1. Show That $2x-3y-13=0$, $4x+y-3=0$, $3x+2y-2=0$ line are concurrent.

2. Evaluate $\int \sqrt{1-\sin 2x}\cdot dx$

3. Show That $\begin{vmatrix} a+b+c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$

V.S.Q :-

1. Find $\frac{d}{dx}(e^{3x})$

2. Find $\frac{d}{dx}(\sin 2x)$

3. Find The $\int (x^4+\cos x)\,dx$

4. Evaluate $\int \frac{dx}{9+x^2}$

5. Evaluate $\lim_{x\to 0} \frac{\sin 2x}{x}$

6. Evaluate $\lim_{x\to 1} \frac{x^4-1}{x^3-1}$

7. Evaluate $\lim_{x\to 0} \frac{e^{7x}-1}{x}$

8. slope- Intercept formulae

9. If $A=\begin{bmatrix}1&2\\1&3\end{bmatrix}$ $I=\begin{bmatrix}1&0\\0&1\end{bmatrix}$ Then find AI

10. If $A=\begin{bmatrix}1&2\\1&3\end{bmatrix}$ Then find A^{-1}

are perpendicular To Each other find The value of λ.

10. If $4\bar{i} + \frac{2p}{3}\bar{j} + p\bar{k}$ is parallel To the vector $\bar{i} + 2\bar{j} + 3\bar{k}$, find The value of 'p'

I Matching:

1. Sin 60°	( )	a)	$\frac{1-\tan^2 A}{1+\tan^2 A}$
2. Tan 90°	( )	(b)	$\frac{2\tan A}{1+\tan^2 A}$
3. Sin 2A	( )	(c)	$\frac{1}{2}$
4. Cos 2A	( )	(d)	∞
		(e)	$\frac{\sqrt{3}}{2}$

II

1. $2+\sqrt{5}i$ additive Inverse	( )	(a)	30
2. $3+4i$ Conjugate complex	( )	(b)	4
3. The mode of 1, 4, 5, 4, 4, 6, 4, 4, 1	( )	(c)	$-2-\sqrt{5}i$
4. The mean of 30, 40, 20, 10, 50	( )	(d)	$3-4i$
		(e)	$2-\sqrt{5}i$

Application of Maths

1. prove That (i) $\sin A \sin(60+A)\sin(60-A) = \frac{1}{4}\sin 3A$ and hence deduce That $\sin\frac{\pi}{9}\cdot\sin\frac{2\pi}{9}\sin\frac{3\pi}{9}\sin\frac{4\pi}{9} = \frac{3}{16}$

2. find The mode for The following data

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Physics major-2

Essay type answer Questions

1. Write about different Renewable Energy resources and energy storage methods?

2. Explain about Quantum communication?
3. What are the recent advances in medical Physics?

Section B

One Sentence answer type Questions

1. What is the primary advantage of solar photovoltaic technology in renewable energy?
2. How does a pumped hydro storage system function as an energy storage device?
3. What is nanotechnology?
4. What is the significance of quantum dots in nanotechnology?
5. What distinguishes quantum communication from classical methods?
6 What is the significance of artificial intelligence in medical physics applications?
7. In what way have radiation therapy techniques advanced in medical physics?
8. How has advanced fluorescence microscopy contributed to recent breakthroughs in biophysics?
9. What role does single-cell biophysics play in understanding cellular heterogeneity?
10. How do recent advancements in magnetic resonance techniques contribute to studying biological systems?

Section C

Matching type Questions

I. Match the renewable energy technology with its application:

1. Photovoltaic cells	A. Heating buildings and water
2. Wind turbines	B. Producing electricity in remote areas
3. Hydropower plants	C. Generating electricity from sunlight
4. Solar water heaters	D. Harnessing wind energy
5. Biomass generators	E. Converting flowing water into electricity

Ans: 1C, 2.D, 3.E 4.A , 5.B

II. Match the medical imaging technique with its description:

1. Magnetic Resonance Imaging (MRI)	A. Uses X-rays to create detailed cross-sectional images
2. Computed Tomography (CT)	B. Utilizes strong magnetic fields and radio waves
3. Ultrasound	C. Provides real-time imaging using sound waves
4. Positron Emission Tomography (PET)	D. Visualizes metabolic activity in the body
5. Nuclear Medicine	E. Produces three-dimensional images of internal structures

Ans : 1B, 2.A 3.C 4. E 5.D

Unit -4

I. Essays questions

1. Explain nano medicine and write applications?
2. Write a note on solid waste management?
3. Write a note on environmental remediation?

II. One word Sentence answer type Questions

1. Energy _____ technologies play a crucial role in smoothing out fluctuations in renewable energy generation (Storage)
2. Grid _____ refers to the ability of a power system to accommodate and manage large

amounts of renewable energy. (Integration)

3. _____ converters are used to convert DC power from solar panels or wind turbines into AC power for the grid.(Inverters)
4. _____ resources like batteries and pumped hydro storage can store excess energy for later use.(Energy)
5. Smart grids use advanced _____ and control systems to improve the efficiency and reliability of the electrical grid. (Technolgy)
7. _____is a key aspect of a smart grid, allowing utilities to better respond to changes in supply and demand.(Demand response)
8. Nanomedicine involves the application of _____ and nanotechnology to the field of medicine.(Nano Particles)
9. Nanoparticles can be engineered to carry drugs directly to the _____ of disease. (Site)
10. Fluorescence _____ is a method used to visualize cellular structures and molecules in living organisms. (Microscopy)
11. Scanning _____ microscopy is a technique that allows for high-resolution imaging of surfaces. (tunnelling)
12. The study of the mechanical aspects of living organisms is known as _____(bio mechanics)
13. In neurophysics, the _____ equation describes how electrical signals propagate along neurons. (cable)
14. _____ is the process by which neurons adjust their sensitivity to incoming signals based on the level of simulation. (plasticity)
15. Radiation therapy may be used as a _____ treatment or in combination with other treatments like surgery or chemotherapy. (primary)

III match the following

1. Smart Grid	( )	a) A localized group of interconnected loads and distributed energy resources that can operate independently from the traditional grid.
2. Frequency Regulation	( )	b) A system that allows utilities to communicate with and control various elements of the electrical grid in real-time.
3.Energy Storage	( )	c) The ability to change electricity usage in response to signals indicating a need to reduce demand.
4. Microgrid	( )	d) The ability of a power system to match generation and consumption in real-time.

ANS) 1. c 2. B 3. D 4. A 5. E

1. Demand Response	( )	a) Real-%me monitoring and control devices that provide synchronized measurements of the power grid.

2. Advanced Metering Infrastructure (AMI)	( )	b) Technology that allows utilities to adjust electricity usage in response to grid conditions or pricing signals.
3. Distribution Automation	( )	c) A system that enables two-way communication between utilities and customers, providing detailed information about electricity usage.
4. Energy Efficiency	( )	d) Implementing technologies to improve the use of electricity, reduce waste, and conserve energy.
5. Phasor Measurement Units (PMUs)	( )	e) Automation of the distribution system, including devices that can automatically re-route power and isolate faults.

Ans) 1) B 2). C 3). E 4). D)5. A

Advances in Chemistry
Unit III &IV
MAJOR-2
10M Essays

1. What is Computer aided drug design and Delivery?
2. What are Nano sensors?
3. Explain the impact of Chemical pollutants on human health
4. Explain the impact of Chemical pollutants on ecosystem
5. what is chemical biology?

VSAQs. 1M

1. What is QSAR?
2. What is Pharmacophore modelling ?
3. What are the types of Nano sensors include?
4. What is Chemical Biology?
5. What is Chemical Genetics?
6. What is Chemical pollutants on Ecosystem?
7. What is Heterogeneous Catalysis?
8. Explain Biodiversity loss Impact of Chemical pollutants on Ecosystem?
9. Write any two Applications of Nano sensors ?
10. Write advantages for dye removal?
11. What is bio orthogonal chemistry?
12. What is Fenton's Reaction?

1. Match the following

Part A	**part B**	
1. Particle size of Nano sensor	a) nickel	(e)
2. Semiconductor of CNT	b) CO2	(a)
3. Rolled of carbon lattice	c) covalent	(b)
4. Carbon bonding in CNT	d)SWCNT	(c)
5. Gaseous chemicals	e) 10- 200nm	(d)

2. Match the following

Part A		**part B**
1.CADD	(C)	a)tiny particles of 10- 100nm
2. inrtradermal	(e)	b) lock and key model
3. Nano sensors drug development	(a)	c) applied to the majority 0f
4. Emil fisher proposed by	(b)	d) rate of reaction
5. catalyst top	(d)	e)drugs and injected into the layer of the skin

Major 2 : Computers

Essay answer questions

1. Classification of number system
2. Explain the transmission media
3. Explain the network devices

Short answer questions

1. Which number system is foundational for computer science and digital electronics?
A. Binary
2. Conversion of Octal number $(540)_8$ to binary number ? A. $(101100000)_2$
3. what Speed of data transmission in 4G network of telecom ?
A. 100 mbps to 1 gbps.
4. what is the primary function of a modem ?
A. Converting analog signals to digital signals
5. What is the primary function of a codec ?
A. multiplexing and demultiplexing signals
6. what is the purpose of the parity bit in parity check ?
A. to indicate the presence of errors in the data
7. what types of errors can parity check detect ?
A. both single-bit and burst errors
8. what is the primary purpose of a repeater?
A. Signal amplification and extension
9. what is the primary function of a gateway ?
A. Protocol translation and network interconnectivity
10. what do routers use to determine the best path for data packets to travel ?
A. internet protocol (IP) addresses

Following Matchings

Matching - I

1. Modem	(c)	a. continuity
2. Analog	(a)	b. Bluetooth
3. Codec	(d)	c. modulation-demodulation
4. Wireless media	(b)	d. multiplexing and de multiplexing

Matching – II

1. MAC	(c)	a. Local area network
2. LAN	(a)	b. Internet protocol
3. WWW	(d)	c. media access control address
4. IP	(b)	d. world wide web

	Government College(Autonomous) Rajahmundry	Program & Semester II B.Sc. (III Sem)			
Course Code 324901	**WAVE OPTICS PRACTICALS**				
Teaching	Hours Allocated: 2hrs/week (**Practicals**)	L	T	P	C
Pre-requisites:	Spectrometer, Travelling microscope, Laser safety operation.	0	0	2	1

COURSE OBJECTIVE:

To develop practical skills in the use of laboratory equipment and experimental techniques for studying light and its interactions with matter.

LEARNING OUTCOMES:

1. Mastery of experimental techniques: Students should become proficient in using laboratory equipment and experimental techniques for studying light and its interactions with matter.
2. Application of theory to practice: Students should be able to apply theoretical concepts learned in lectures to real-world situations, and understand the limitations of theoretical models.
3. Accurate recording and analysis of data: Students should be able to accurately record and analyze experimental data, including understanding the significance of error analysis and statistical methods.
4. Critical thinking and problem solving: Students should be able to identify sources of error, troubleshoot experimental problems, and develop critical thinking skills in experimental design and analysis.
5. Understanding of physical principles: Students should develop an understanding of the physical principles governing optics, including reflection, refraction, diffraction, interference, and polarization.

Minimum of 6 experiments to be done and recorded

1. Determination of radius of curvature of a given convex lens-Newton‟s rings.
2. Resolving power of grating.
3. Study of optical rotation –polarimeter.
4. Dispersive power of a prism.
5. Determination of wavelength of light using diffraction grating-minimum deviation method.
6. Determination of wavelength of light using diffraction grating-normal incidence method.
7. Determination of wavelength of laser light using diffraction grating.
8. Resolving power of a telescope.
9. Refractive index of a liquid-hallow prism
10. Determination of thickness of a thin wire by wedge method

QUESTION BANK FOR SEMESTER -I

GOVERNMENT COLLEGE (A)

RAJAHMUNDRY WAVE OPTICS

CHAPTER –I

INTERFERENCE LONG ANSWER TYPE QUESTIONS

(7 MARKS)

1. Explain the occurrence of Interference fringes in Lloyd‟s Arrangement. Explain the type of fringes obtained it.
2. Explain the occurrence of Interference fringes in Lloyd‟s Arrangement .How the wavelength of light can be determined through it.
3. What is wedge shaped film .Describe the fringes observed when a wedge shaped film is illuminated by light. Calculate the separation between two consecutive bright and dark bands.
4. Describe how the wavelength of sodium light can be determined using Newton rings. Derive the formula used for it.
5. Describe Newton rings method for measuring the wavelength of monochromatic light. Give the necessary theory.
6. Describe the Principle, construction and working of a Michelson Interferometer. Explain how the wavelength of light is determined with it.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

1. What are the conditions of interference?
2. Explain the cosine law.
3. Explain the formation of colors in thin films.
4. Write a note on Interference fringes by wedge shaped films.

CHAPTER –II

DIFFRACTION LONG ANSWER TYPE QUESTIONS

(7MARKS)

1. Describe the Fraunhoffer Diffraction due to a single slit and deduce the positions of maxima and minima.
2. Describe the Fraunhofer Diffraction due to a single slit. Draw the respective graph of the Intensity distribution.
3. What is a grating? Find conditions for Principal maxima, minima inFraunhofer diffraction pattern with N slit.
4. Explain how plane transmission grating is used to determine the wavelength of the given light.
5. What is Fresnel‟s half period zones. Give the theory of Fresnel‟s diffraction of light .Explain the intensity distribution in diffraction pattern.
6. Explain Fresnel‟s half period zones. Derive an expression for the amplitude due to nth zone.
7. What is a zone plate? How is it constructed? Show that it acts as a convex lens of different focal lengths.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

1. Give the differences between Fraun hofer and Fresnel‟s diffraction.
2. Distinguish between Interference and Diffraction.
3. Compare zone plate and convex lens.
4. Obtain the formula for resolving power of Grating.
5. Define and explain diffraction with at least two examples.

CHAPTER –III POLARIZATION

LONG ANSWER TYPE QUESTIONS (7 MARKS)

1. Explain the construction and working of Nicol Prism.
2. What is a Nicol prism? Explain how it works as Analyzer and Polarizer.
3. What is optical activity? Describe how the specific rotation of sugar solution is determined experimentally.
4. Define specific rotation. Describe the construction and working of Laurnt‟s half shade polari menter.
5. Define specific rotation. Explain how you would use it to determine the specific rotation of sugar solution.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

1. State and explain Brewster‟s law.
2. State and Explain malus Law.
3. Explain the phenomena of double refraction.
4. Explain what is meant by half wave plate.
5. Explain what is meant by Quarter wave plate
6. Write a short note on LCD‟s

CHAPTER –IV ABERRATIONS

LONG ANSWER TYPE QUESTIONS (7 MARKS)

1. What is Chromatic Aberration? Obtain an expression for the Chromatic Aberration of a lens.
2. What is Chromatic Aberration? Derive the condition for achromatism when two lenses are in contact and separated by a distance.
3. What is spherical aberration in a lens? Discuss various methods to minimize it.
4. What is spherical aberration in a lens? Explain how the spherical aberration can be minimized when two thin lenses separated by a distance. Obtain condition for it.
5. Discuss different types of optical fibres.
6. Discuss the Modes (i) Step index (ii) Graded index Fibres and their structures.
7. Describe the how the optical fibre is used for communication and explain its advantages

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

1. What is the phenomenon on which the optical works?
2. Give the principle of fibre communication.
3. Explain the principle and working of optical fibre.
4. Give the applications of fibre optics.
5. What is coma? How it can be minimized?
6. What is Astigmatism? What are the conditions for astigmatism?
7. Explain curvature and distortion?

CHAPTER –V LASERS AND HOLOGRAPHY

LONG ANSWER TYPE QUESTIONS (7 MARKS)

1. Define Einstein Coefficients. And obtain the relation between them.
2. Describe the construction and working of Ruby Laser.
3. Describe the construction and working of Helium- Neon Laser.
4. Explain the basic of Holography and discuss the applications of holography.

SHORT ANSWER TYPE QUESTIONS (3 MARKS)

2. What are the applications of Lasers?
3. Define Spontaneous and stimulated emission.
4. Distinguish between Spontaneous and stimulated emission.
5. What is holography?
6. Explain population Inversion and metastable state.

	Government College (Autonomous) Rajahmundry
Course Code	HEAT AND THERMODYNAMICS

Question Bank:

UNIT-I

1. Describe the Toothed wheel experiment for verification of Maxwell‟s law of distribution of molecular velocities
2. Define Mean free path
3. What is thermal conductivity? Derive an expression for coefficient of thermal conductivity.
4. Define Viscosity of gases? Derive an expression for coefficient of viscosity of gases.
5. What do mean by Diffusion of gases? Derive an expression for coefficient of Diffusion of gases.
6. State the postulates of kinetic theory of gases
7. Explain about the Transport phenomena in ideal gases
8. How do you determine the C_{rms} velocity

UNIT-II

1. Differentiate between Isothermal and Adiabatic processes.
2. What is heat engine? Determine the efficiency of a Carnot heat engine.
3. Explain briefly about Reversible and irreversible processes.
4. Discuss about the second law of Thermodynamics.
5. Explain about the change in entropy in reversible and irreversible processes.
6. What is Entropy? Explain its physical significance.
7. Discuss about principle of refrigeration.
8. What is T-S diagram and mention its uses

UNIT-III

1. Explain briefly about Thermo dynamical potentials and its significance
2. Derive of Maxwell‟s thermodynamic relations from thermodynamic potentials
3. Derive the difference and ratio between C_p and C_v
4. Determine the expression for Clausius-Clayperon‟s equation

UNIT-IV

1. Explain about Joule Kelvin effect- Porous plug experiment
2. Describe an expression for Joule-Thomson cooling
3. Distinguish between Adiabatic and Joule-Thomson expansion
4. Discuss about the liquefaction of Helium by Kapitza‟a method
5. Interpret the phenomenon of Production of low temperatures by adiabatic demagnetization
6. Write down the practical applications of substances at low temperatures

UNIT-V

1. What is Black body radiation? Give examples
2. Explain about spectral energy distribution of black body radiation
3. Give definitions for (i) Kirchoff‟s law (ii) Wein‟s displacement law (iii) Stefan-Boltzmann‟s law and (iv) Rayleigh-Jean‟s law

4. Derive Planck‟s law of black body radiation
5. Deduction of Wein‟s law and Rayleigh- Jean‟s law from Planck‟s law
6. Define Solar constant and determine it using Angstrom pyroheliometer
7. How do estimate the surface temperature of Sun

Question Bank: Modern Physics

UNIT-I

1. Explain the Quantum Numbers associated with Vector Atom model.
2. Describe the Stern and Gerlach experiment and indicate the importance of the results obtained.
3. What is Raman Effect? Explain the formation of Stoke‟s and Anti Stoke‟s lines on the basis of quantum theory.
4. Explain L – S Coupling Scheme.
5. Explain j – j Coupling Scheme.
6. Mention any four applications of Raman Effect.
7. The Exciting line in an experiment is 5460A° and stokes line is at 5520A^0.Find the wave length of anti – stokes line.
8. A sample was excited by 4358 A^0 line. A Raman line was observed at 4447 A^0. Calculate the Raman shift.
9. What is Zeeman Effect?

UNIT-II

1. Describe the Davisson and Germer experiment to demonstrate the wave character of electrons.
2. What are matter waves? Derive an expression for de-Broglie wavelength of matter waves.
3. State and Explain Heisenberg‟s uncertainty principle for position and momentum. Extend it to Energy and Time.
4. Write the properties of matter waves.
5. Explain de – Broglie hypothesis of matter waves.
6. Calculate the de-Broglie wavelength associated with a proton moving with a velocity equal to $1/20^{th}$ of the velocity of light. (Mass of the proton is $1.67x10^{-27}$kg)
7. If the uncertainty in the momentum of an electron is $1.65x10^{-24}$ kg m/sec. calculate the uncertainty in its position.
8. What are matter waves?
9. Illustrate the uncertainty principle using diffraction of beam of electrons (Diffraction by a single slit).
10. Discuss about Bohr‟s principle ofcomplementarily**. UNIT – III**

1. Derive Schrodinger time dependent wave equation.
2. Derive Schrodinger time independent wave equation.
3. Obtain an expression for the energy of particle in one dimensional potential well of infinite height.
4. Mention the basic postulates of quantum mechanics.
5. Explain the physical interpretation of wave function.
6. Find the least energy of an electron moving in the dimension in an infinitely high potential box of width 1A^0. Given mass of the electron $9.11x10^{-31}$ kg and h=$6.63x10^{-34}$ J-s
7. What is meant by Eigen functions and Eigen values?

UNIT –IV

1. Explain liquid drop model in detail. Write its drawbacks.
2. Explain shell model of nucleus. Mention its merits and demerits.
3. Explain Gamow‟s theory of α-decay
4. Explain any four basic properties of nuclei.
5. Discuss about the Yukawa‟s meson theory
6. Explain neutrino hypothesis
7. A nucleus of mass number 125 has radius 6 Fermi. Find the radius of a nucleus having mass number 64.

8. Define binding energy and explain with examples.
9. What are magic numbers?
10. Discuss about G.M. Counter and Cloud chamber for nuclear radiation detection.

UNIT-V

1. Define nano materials. Discuss about electron confinement, size effect and surface to volume ratio.
2. Discuss about various types of nanomaterials.
3. Explain about carbon nano tubes and Graphene.
4. Discuss about the properties of nanomaterials.
5. Explain about the vital applications of nanomaterials
6. Explain Type-I and Type-II superconductors?
7. Explain the Meissner effect.
8. Mention the applications of superconductors
9. Discuss about BCS theory.
10. Define critical temperature, critical magnetic field and isotope effect.

	Government College (Autonomous) Rajahmundry	Program & Semester			
Course Code PHY6A	**TITLE OF THE COURSE** **OPTICAL INSTRUMENTS AND OPTOMETRY (Skill Enhancement Course (Elective), Credits: 05)**	IV Year B. Sc.(Hons) – Semester – V			
Teaching	Hours Allocated: 50,Max.marks 100 (**Theory**)	L	T	P	C
Pre-requisites	Learn aberrations, basic principles of travelling microscope and Telescope	3	-	-	3

Course Objectives:

1. Need and Different types of microscopes
2. Construction and working of various types of microscopes
3. Types, working principle and applications of various Telescopes
4. Study of optical vision
5. Understanding of Ophthalmic techniques and optometry

Course Outcomes:

On Completion of the course, the students will be able to		cognitive domain
CO1	Understand the construction and working principles of various optical instruments used in daily life.	Understanding
CO2	Acquire a critical knowledge on the various defects of eye and their correcting methods with suitable lenses	Remembering
CO3	Demonstrate skills of using biological microscope through hands on experience	Applying
CO4	Understand the various techniques used in optometry and computer based eye testing	Understanding
CO5	Comprehend the various applications of microscopes and telescopes	Analyzing and Applying

Course with focus on Employability / Entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Question Bank:

UNIT-I

1. Discuss about the construction and normal adjustment of Simple microscope
2. Describe the construction and working of a Travelling microscope
3. Define Microscope
4. What are the uses of microscope
5. State the operating principle of a Phase contrast microscope
6. Write about different types of microscopes
7. Explain about the need of microscope
8. How do you determine magnifying power of a Compound microscope

UNIT-II

1. Differentiate between Astronomical telescope and Terrestrial telescope
2. Explain briefly about Refracting and Reflecting telescopes
3. How do you determine the magnifying power of an Astronomical telescope
4. What are the uses of a Telescope
5. Write about working principle and applications of Binoculars
6. Discuss about various types of Telescopes

UNIT-III

1. Explain briefly about Optical microscopes like Compound microscope, Stereo microscope, Confocal microscope
2. Write about the applications of various microscopes
3. Give explanation for Scanning Probe Microscope
4. Write short notes on ideas and applications of Telescopes
5. Discuss about Electron microscopes like TEM and SEM
6. Distinguish between Microscopes and Telescopes
7. Describe (i) Optical telescopes (ii) Radio telescopes (iii) X-ray telescope

UNIT-IV

1. Explain about how an Eye act as an optical instrument
2. Write about optical vision
3. Define ophthalmic lenses. Give explanation for Removal of defects in vision using ophthalmic lenses
4. Write short notes on Far points and near points
5. Discuss about Myopia and Hypermetropia defects
6. Distinguish between ophthalmic lenses and contact lenses
7. Interpret the phenomenon of Formation of image in the eye and the camera
8. Describe the Working principle of contact lenses

UNIT-V

1. Write about Ophthalmoscope
2. Explain about keratometer and their working principle
3. Give explanation for checking the power of lenses
4. Write short notes on Evaluation of eye disorders
5. Discuss about Evaluation of eye disorders
6. Interpret the Principles of Computer based eye testing

	Government College (Autonomous) Rajahmundry	Program & Semester			
Course Code PHY7A	**TITLE OF THE COURSE** **OPTICAL IMAGING AND PHOTOGRAPHY (Skill Enhancement Course (Elective), Credits: 05)**	IV Year B. Sc.(Hons) – Semester – V			
Teaching	Hours Allocated: 50,Max.marks 100 (**Theory**)	L	T	P	C
Pre-requisites	Different optical lenses, aberrations of lenses,drones,image sensors, Data storage devices, resolutions of a lenses	3	-	-	3

Course Objectives:

1. Image formation in camera and eye
2. Different types of cameras
3. Understanding various light sources used in photography
4. Study of photo manipulation using various software's
5. Learning various photographic shooting

Course Outcomes:

On Completion of the course, the students will be able to		cognitive domain
CO1	Identify the different types of cameras and camera lenses according to different purposes.	Remembering
CO2	Identify and understand the focal length of the different types of lenses	Remembering and understanding
CO3	Acquire a critical knowledge on natural and artificial sources of light and their application in photography	Applying
CO4	Demonstrate skills of camera usage especially Digital Cameras. Understand the various Image development and editing techniques	Evaluating
CO5	Comprehend the concept of different types of common shooting techniques	Analyzing

Course with focus on Employability / Entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Question Bank:

UNIT-I

1. Discuss about Image formation in simple camera and human eye
2. Describe the Working principle of a camera
3. Define Photography
4. What are the factors influencing choice of camera
5. Write about Care and maintenance of camera
6. Explain about Digital cameras and Drone flying cameras
7. Differentiate between Single Lens Reflex (SLR) camera, Twin Lens Reflex (TLR) camera

UNIT-II

1. Discuss about different types of Digital cameras and their parts
2. Explain about the working of DSLR camera
3. How do you determine Depth of focus, Depth of field
4. Explain about the knowledge on pixels and their uses
5. Write briefly about normal, wide angle and zoom lenses
6. Discuss about Digital Image formation, Aperture, Shutter speed, ISO and filters

UNIT-III

1. Explain the need for the light in photography
2. Write short notes on Artificial light sources like Flood light, Spot light, Halogen light, Halogen flash light, Digital lights
3. Discuss about Studio photography
4. Interpret the phenomenon of exposure
5. Describe about Light sources like Natural light, Sun light, Moon light, Ambient light

UNIT-IV

1. Discuss about Techniques of Photomicrography
2. Describe the significance and role of Camera lens in photo shooting
3. Explain about Techniques involved in the use of DSLR cameras
4. What are uses of filters
5. Write about Medical Photography and Astronomical Photography
6. Explain High speed Photography with motor driven camera and Basic ideas on Underwater Photography
7. Write about Forensic Photography

UNIT-V

1. Discuss about developing and printing the photographs
2. Describe the equipment and materials used in developing and printing, image mixing and printing
3. Explain briefly how the Image editing through image editing software's like Adobe Photoshop
4. What is adjustment of Brightness, Contrast
5. What are the factors influencing quality of digital image

	Government College (Autonomous) Rajahmundry	Program & Semester			
Course Code PHY6B	TITLE OF THE COURSE LOW TEMPERATURE PHYSICS & REFRIGERATION (Skill Enhancement Course (Elective), Credits: 05)	IV Year B. Sc.(Hons) – Semester – V			
Teaching	Hours Allocated: 50 (**Theory**)	L	T	P	C
Pre-requisites	Thermo Dynamic Laws, fluid mechanics, Condensation, States of matter, Phase diagram of material,	3	-	-	3

Course Objectives:

1. Different methods of liquefaction
2. Learning various types of thermometers
3. knowledge on refrigeration and air conditioning
4. Learning various applications of low temperature & refrigeration

Course Outcomes:

On Completion of the course, the students will be able to		cognitive domain
CO1	Identify various methods and techniques used to produce low temperatures in the Laboratory.	Remembering
CO2	Acquire a critical knowledge on refrigeration and air conditioning	Understanding
CO3	Demonstrate skills of Refrigerators through hands on experience and learns about refrigeration components and their accessories	Applying
CO4	Understand the classification, properties of refrigerants and their effects on environment	Understanding
CO5	Comprehend the applications of Low Temperature Physics and refrigeration	Analyzing

Course with focus on Employability / Entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Question Bank

UNIT-I

1. Define and Discuss about Regenerative cooling
2. Describe the Joule-Thomson effect
3. What are the Freezing mixtures
4. Write Properties of materials at low temperatures
5. Explain Adiabatic demagnetization
6. Describe about production of liquid hydrogen and nitrogen
7. Discuss about different methods of liquefaction of gases and explain about liquefaction of air

UNIT-II

1. Explain Gas thermometer and its correction and calibration
2. Differentiate between thermometers and thermocouples
3. Discuss about Resistance thermometers, Vapour pressure thermometers and Magnetic thermometers
4. Write about Advantages and drawbacks of each type of thermometer
5. Discuss about thermocouples

UNIT-III

1. What is Refrigeration? Mention the types of Refrigeration
2. Discuss about the Stages of refrigeration
3. Draw the block diagram and explain Refrigeration cycle
4. Distinguish between Natural and artificial refrigeration
5. Explain Vapour compression and vapour absorption refrigeration systems,
6. What is Ideal refrigerant? What are commonly used refrigerants
7. Write the role of Refrigerants in air conditioners
8. Interpret the phenomenon of Eco-friendly refrigerants
9. What are the properties of refrigerant

UNIT-IV

1. Discuss about Refrigerator and its working with Block diagram
2. Describe the types of compressors, evaporators and condensers and their functional aspects
3. Explain defrosting in a refrigerator
4. Define Coefficient of Performance (COP), Tons of refrigeration (TR) and Energy Efficiency Ratio (EER)
5. Explain Refrigerant leakage and detection

UNIT-V

1. What are the applications of Low temperatures
2. Discuss about Preservation of biological material
3. Describe the role of liquid nitrogen and liquid hydrogen in medical field

4. What is Food freezing
5. Explain Tissue ablation (cryosurgery) and Cryogenic rocket propulsion system
6. Explain about the various applications of Refrigeration

GOVERNMENT COLLEGE (A), RAJAHMUNDRY

III B.Sc Physics – V SEM

6B: LOW TEMPERATURE PHYSICS AND REFRIGERATION

MODEL PAPER

Time: 2 ½ hrs **Max. Marks:50M**

SECTION A

Answer ALL Questions (each questions carries 7 marks) **5X7 =35M**

1. Describe the Joule-Thomson effect.

OR

2. Discuss about different methods of liquefaction of gases and explain about liquefaction of air.
3. Discuss about Resistance thermometers, Vapour pressure thermometers and Magnetic thermometers.

OR

4. Discuss about thermocouples.
5. Explain Vapour compression and vapour absorption refrigeration systems.

OR

6. Write the role of Refrigerants in air conditioners

7. Explain Vapour compression and vapour absorption refrigeration systems.

OR

8. Explain Refrigerant leakage and detection
9. Explain Tissue ablation (cryosurgery) and Cryogenic rocket propulsion system.

OR

10. Discuss about Preservation of biological material

SECTION B

Answer any FIVE Questions (each question carries 3 marks) **5X3 =15**

11. Define and Discuss about Regenerative cooling.
12. Explain Gas thermometer and its correction and calibration.
13. Explain Gas thermometer and its correction and calibration.
14. Write the role of Refrigerants in air conditioners.
15. Explain defrosting in a refrigerator.
16. Discuss about Preservation of biological material.
17. What is Food freezing.
18. Describe the role of liquid nitrogen and liquid hydrogen in medical field.

	Government College (Autonomous) Rajahmundry	Program & Semester			
Course Code PHY7B	**TITLE OF THE COURSE** Solar Energy and Applications **(Skill Enhancement Course (Elective), Credits: 05)**	IV Year B. Sc.(Hons) – Semester – V			
Teaching	Hours Allocated: 50,Max.marks 100 (**Theory**)	L	T	P	C
Pre-requisites	Basic idea about Latitudes and Longitudes, Introduction to semiconductors, PN junction diode and its characteristics	3	-	-	3

Course Objectives:

1. Learning various radiation measurements
2. Understanding various solar thermal collectors and Solar water heaters
3. Learning various types of solarcells and modules

Course Outcomes:

On Completion of the course, the students will be able to		cognitive domain
CO1	Understand Sun structure, forms of energy coming from the Sun and its measurement.	Understanding
CO2	Acquire a critical knowledge on the working of thermal and photovoltaic collectors	Remembering
CO3	Demonstrate skills related to callus culture through hands on experience	Applying
CO4	Understand testing procedures and fault analysis of thermal collectors and PV modules	Understanding
CO5	Comprehend applications of thermal collectors and PV modules.	Analyzing

Course with focus on Employability / Entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Question Bank:

UNIT-I

1. Explain about Spectral distribution of solar radiation
2. Describe the working principle of Pyroheliometer
3. Explain the working Principle of Pyrometer
4. Define and explain Solar constant
5. What is zenith angle and Air-Mass
6. State and explain standard time
7. Write short note on equation of time

UNIT-II

1. What are the Solar Thermal Collectors and explain Flat plate collector
2. Write a short notes on Solar cookers, Solar dryers, Solar desalinators
3. Describe about Concentrating collectors
4. Define collector efficiency factor, collector heat-removal factor and collector flow factor
5. Explain about Evacuated tube collector

UNIT-III

1. Define and explain Schottky barrier
2. What are the advantages and drawbacks of solar cells
3. Draw and explain I-V characteristics of a Solar cell
4. Define series and shunt resistance? Give explanation about their effect on efficiency
5. Write short notes on Photovoltaic cell
6. Discuss about conversion efficiency and quantum efficiency

UNIT-IV

1. What are different types of solar cells
2. Discuss about I-V characteristics of Crystalline silicon solar cells
3. Describe the structure and configurations of thin film solar cells - CdTe/CdS
4. What are the advantages and limitations of solar cells
5. Describe briefly about the various steps involved in Module fabrication
6. Write about Modules in series and parallel
7. Explain Double and triple junction cells

UNIT-V

1. Discuss about Energy storage modes
2. Describe the Energy storage in PV systems
3. Write about Mechanical storage – Flywheel
4. Write about Electrical storage –Super capacitor
5. Explain briefly about Solid-state battery, Molten solvent battery, lead acid battery and dry batteries

	Government College (Autonomous) Rajahmundry	Program & Semester			
Course Code PHY6C	**TITLE OF THE COURSE** **APPLICATIONS OF ELECTRICITY & ELECTRONICS** **(Skill Enhancement Course (Elective), Credits: 05)**	IV Year B. Sc.(Hons) – Semester – V			
Teaching	Hours Allocated: 50,Max.marks 100 (**Theory**)	L	T	P	C
Pre-requisites	Basics of Electric field and potentials, Electro Magnetic Induction, Fraday'sLaw, Ampere's, Fleming Left Hand rule,	3	-	-	3

Course Objectives:

1. Knowledge on Resistors, Capacitors and Inductors
2. Introduction to energy storage batteries
3. Learning about various power supplies

Course Outcomes:

On Completion of the course, the students will be able to		cognitive domain
CO1	Identify various components present in Electricity& Electronics Laboratory...	Remembering
CO2	Acquire a critical knowledge of each component and its utility (like resistors, capacitors, inductors, power sources etc.)	Understanding
CO3	Demonstrate skills of constructing simple electronic circuits consisting of basic circuit elements	Applying
CO4	Understand the need & Functionality of various DC & AC Power sources	Understanding
CO5	Comprehend the design, applications and practices of various electrical & Electronic devices and also their trouble shooting.	Analysing

Course with focus on Employability / Entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

Question Bank:

UNIT-I

1. What are Passive and Active elements
2. Define the terms Resistor, Capacitor and Inductor
3. Discuss about Applications of a Resistor as a heating element in heaters and as a fuse element
4. Describe the Applications of Capacitor in power supplies, motors
5. Define and explain Energy stored in a capacitor
6. Write about Series resonance circuit as a Radio tuning circuit
7. Explain Application of choke in a fan and in a radio tuning circuit

UNIT-II

1. What are the differences between AC and DC
2. Describe different types of AC & DC sources
3. Explain briefly about Rechargeable batteries i.e Lead acid batteries, Ni-MH batteries, Li-ion batteries- Li-PO batteries
4. Describe Series, Parallel & Series-Parallel configuration of batteries
5. Discuss about Constant Voltage source-Constant Current Source
6. What are the applications of Current sources & Voltage sources
7. Discuss about SMPS used in computers

UNIT-III

1. Draw and explain the working principle of a transformer
2. Describe construction and working principle of a Generator,
3. Distinguish between Step-up and Step-down transformers
4. Define emf? Explain relation between primary turns and secondary turns of the transformer
5. What is the use of a transformer in a regulated power supplies
6. Discuss about working principle of single phase motor
7. Write the Applications of motors

UNIT-IV

1. Discuss about working of a DC regulated power supply
2. Describe the construction of a 5 volts regulated power supply
3. Define FM? Describe simple design of FM Radio circuit using LCR series resonance (tuning) circuit
4. Explain about the design of a simple 5 volts DC charger
5. Write a short note on power supply for computers (SMPS)
6. Explain the design of a step-down (ex: 220-12V) transformer
7. How do you checking the output voltage of a battery eliminator using a Multi Meter (Trouble shooting)

UNIT-V

1. Discuss about

2. Describe the construction and operating principle of a DC motor
3. Define the terms (i) calculation of power (ii) voltage and (iii) current in a DC motor
4. Explain briefly about the design of a simple Motor (Fan) with suitable turns of coil
5. Explain the construction, operating principle and EMF equation of a DC generator
6. Write the differences between DC and AC generators

	Government College (Autonomous) Rajahmundry	Program & Semester			
Course Code PHY7C	**TITLE OF THE COURSE** ELECTRONIC INSTRUMENTATION **(Skill Enhancement Course (Elective), Credits: 05)**	IV Year B. Sc.(Hons) – Semester – V			
Teaching	Hours Allocated: 50,Max.marks 100 (**Theory**)	L	T	P	C
Pre-requisites	Direct current, Alternating currents,Resistors,Inductors,Capacitors,Ohm's Law,Semiconductors,Diodes, Potential difference, Ultra sounds	3	-	-	3

Course Objectives:

1. Need and Different types of microscopes

Course Outcomes:

On Completion of the course, the students will be able to		cognitive domain
CO1	Identify various facilities required to set up a basic Instrumentation Laboratory.	Remembering
CO2	Acquire a critical knowledge of various Electrical Instruments used in the Laboratory	Understanding
CO3	Demonstrate skills of using instruments like CRO, Function Generator, Multimeter etc. through hands on experience.	Applying
CO4	Understand the Principle and operation of different display devices used in the display systems and different transducers	Understanding
CO5	Comprehend the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oximeter etc. and know the handling procedures with safety and security..	Analysing

Course with focus on Employability / Entrepreneurship / Skill Development modules

Skill Development		Employability		Entrepreneurship	

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	3	3	3	1	2	2	3	2	3	2	3	2	2
CO2	3	2	3	3	2	3	3	1	3	3	3	2	1	2	3	1
CO3	2	3	2	3	2	3	2	2	2	3	2	2	3	3	1	2
CO4	3	2	3	2	2	2	3	3	1	1	3	1	2	2	2	1

Question Bank

UNIT-I

1.Discuss about construction and working of an Analog Multimeterwith a Block diagram
2.Describe the construction and working of a Digital Multimeter with Block diagram
3.Define Voltmeter
4.What is sensitivity and how do you determine the sensitivity of an instrument
5.Differentiate between DC Voltmeter and AC Voltmeter
6.Explain about basic ideas on Function generator
7.Write a note on Analog instruments & Digital Instruments

UNIT-II

1.Draw the block diagram and explain the parts of a CRO
2.Write down the use of CRO for the measurement of voltage
3.Explain different types of oscilloscopes and their uses
4.How do you determine (i) frequency and (ii) phase difference in CRO
5.Discuss about Digital Storage Oscilloscope
6.Discuss about various functions of a CRO

UNIT-III

1.Explain about Resistive and capacitive touch screen transducer used in mobiles
2.Interpret the Selection of transducers
3.What is a transducer? classify them
5.Write short notes on fibre optic sensors
6.Discuss about Piezoelectric transducer
7.Distinguish between Photo transducer, Digital transducer

UNIT-IV

1.What are display devices? Write down the types of display devices
2.Discuss about construction and operation LED displays
3.Describe the construction and operation of seven segment displays
4.What is SSD? Mention the limitations of SSDs
5.Write about Liquid Crystal Displays and applications of LCD modules
6.Explain principle and working of 2x16 display and 4x16 LCD modules

UNIT-V

1.Discuss about basic operating principle and use of (i) Clinical thermometer (ii) Stethoscope
2.Describe the basic ideas of CT scan and MRI scan
3.Discuss about operating principle and use of Radiography
4.Explain about Ultrasound scanning and its uses
5.Explain the terms (i) Ventilator (ii) Pulse oxymeter (iii) Glucometer
6.How do you get the functioning of heart using ECG machine