F–9394	Sub. Code
	7MPH1C1

M.Sc. DEGREE EXAMINATION, APRIL 2023.

First Semester

Physics

MATHEMATICAL PHYSICS – I

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What do you mean by line, surface and volume integral?

2. Define linear vector space.

3. Find the eigen values of $A = \begin{bmatrix} 1 & 2 & 0 \\ 2 & 4 & 0 \\ 4 & 8 & 0 \end{bmatrix}$

4. Solve the differential equation $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 0.$

5. State Cauchy Riemann conditions for analyticity of a function of complex variable in cartesian and polar coordinates.

6. Define pole and residue of a pole.

7. What happens to Fouriers series expansion of a periodic function, if the function is even in nature.

8. List out the uses of Fourier series.

9. Find Fourier transform of the function.

$$f(x) = \begin{cases} 1, \text{ for } |x|<a \\ 0, \text{ for } |x|>a \end{cases}$$

10. State shifting property of Fourier transform.

Part B $(5 \times 5 = 25)$

Answer **all** questions, choosing either (a) or (b).

11. (a) Evaluate by Stoke's theorem.

$\int \left(e^x dx + 2y dy - dz\right)$ where C is the curve $x^2 + y^2 = 4, z = 2.$

Or

(b) From the set of vectors (1, 0, 1) (0, 0, 1) and (1, 1, 0) construct a set of orthonormal vectors.

12. (a) Find eigen values and eigen vectors of the matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 1 \\ 3 & 1 & 1 \end{bmatrix}$$

Or

(b) Find a power series solution to the differential equation $\frac{d^2y}{dx^2} + \lambda^2 y = 0$, $\lambda =$ constant.

13. (a) Find the first three terms of the Tayler series expansion of $f(z) = \frac{1}{z^2 + 4}$ about $z = -i$. Also find the region of convergene.

Or

(b) Find the residue of $f(z) = \frac{e^z}{z^2 + a^2}$ at its singularities.

14. (a) Expand in Fourier series, the function $f(x) = x^2$ for $0 < x < 2\pi$

Or

(b) Find the Fourier integral of the function
$f(x) = 0$ when $x < 0$

$= \frac{1}{2}$ when $x = 0$

$= e^{-x}$ when $x > 0$

Verify the representation directly at the point $x = 0$

15. (a) Find sine Fourier transform for the function

$$f(x) = \begin{cases} x^2, \text{ for } 0 \le x < \pi \\ 0, \text{ elsewhere.} \end{cases}$$

Or

(b) Find the finite cosine transform of $f(x)$ if $f(x) = \pi/3 - x + \frac{x^2}{2\pi}$.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe the Schmidt orthogonalisation procedure of constructing an orthogonal set of functions from a non orthogonal set.

17. Diagonalise the matrix $A = \begin{bmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{bmatrix}$

18. Apply calculus of residues to show that $\int_0^{2\pi} \frac{d\theta}{a + b\cos\theta} = \frac{2\pi}{\sqrt{a^2 - b^2}}, a > b > 0$

19. Expand the function $f(x) = \sin x$ as a cosine series in the interval $(0, \pi)$.

20. Find Fourier cosine transform of the function $f(x) = e^{-x2}$.

———————

F–9395

Sub. Code
7MPHE1A

M.Sc. DEGREE EXAMINATION, APRIL 2023.

First Semester

Physics

Elective – NUMERICAL METHODS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. An approximate value of Pi is given by $X_1 = \frac{22}{7} = 3.1428571$ and its value is $X = 3.1415926$. Find the absolute and relative errors.

2. What is regression?

3. State the order of convergence and convergence condition for Newton-Raphson method.

4. Compare Gauss Elimination and Gauss Jordan method.

5. Define Linear interpolation.

6. Write any two properties of divided difference.

7. State Eulers formula.

8. State the second order Runge-Kutta algorithm.

9. What advantage has Lagrange's formula over Newton?

10. State Simpson's one-third rule.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Give the general formula for errors and their types.

Or

(b) Find the best values of a_0 *and* a_1, if the straight line $y = a_0 + a_1 x$ is fitted to the data (x_i, y_i) (1, 0.6), (2, 2.4), (3, 3.5), (4, 4.8), (5, 5.7) Also find the correlation co-efficient.

12. (a) Using Newton Raphson method, find a real root, correct to 3 decimal places, of the equation $\sin x = \frac{x}{2}$ given that the roots lies between $\pi/2$ *and* π.

Or

(b) Solve the system

$6x + y = z = 20$

$x + 4y - z = 6$

$x - y + 5z = 7$

By Gauss Seidal method.

13. (a) Using Newton's forward difference formula, find the sum $S_n = 1^3 + 2^3 + 3^3 + ... + n^3$.

Or

(b) Write a C program for Lagrange Interpolation.

14. (a) Using Euler's method, solve $y' = \frac{3}{5}x^3 y,\ y(0) = 1.$

Or

(b) Use the Runge-Kutta Fourth order method to estimate $y(0.4)$. When $y'(x) = x^2 + y^2$ with $y(0) = 0.$ Assume $h = 0.2.$

15. (a) Estimate the value of $\sin\theta$ at $\theta = 38°$ using Newton-forward difference formula with the help of the following table.

θ	15	20	25	30	35	40
$\sin\theta$	0.2588190	0.3420201	0.4226183	0.5	0.5735764	0.6427876

Or

(b) Write a C program to evaluate given integral using Simpson's method.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Fit a second order polynomial to the data in the table

x	1.0	2.0	3.0	4.0
y	6.0	11.0	18.0	27.0

17. Write a C-program for solution of linear equations using simple Gaussian Elimination method.

18. The following data gives the melting point of an alloy of lead and zinc. Where t is the temperature in deg – c and p is the percentage of lead in the alloy.

p :	40	50	60	70	80	90
t :	184	204	226	250	276	304

using the interpolation in Newton formula find the melting point of the alloy containing 84% of lead.

19. Write a 'C' program for solving ordinary differential equation using Runge-Kutta method.

20. Compute derivative using Newton's forward and backward difference formulae.

———————

F–9396

Sub. Code
7MPH2C1

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Physics

SOLID STATE PHYSICS

(CBCS – 2017 Onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. What is Bravis lattice?
2. Define defects and dislocations of crystal.
3. What is meant by Phonon momentum?
4. Define stiffness constants.
5. State ohm's law.
6. Mention the order of bandgap for a metal, a semiconductor and an Insulator.
7. What is Polarizability?
8. Define Quenching.
9. What is Coherence length?
10. Define Magnons.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain the ZnS Structure with diagram.

Or

(b) Describe the rotating crystal method for diffraction of X-rays.

12. (a) Define primitive cell. Explain the Quantization of lattice vibrations.

Or

(b) Explain Inelastic Scatterings of neutrons and phonons.

13. (a) Explain the Energy levels and density of orbital in one dimension.

Or

(b) Describe the Effective mass and density of status.

14. (a) Discuss the theory of Paramagnetism for conduction electrons.

Or

(b) Explain the different types of polaization mechanisms with neat diagram.

15. (a) Derive first and second London equation.

Or

(b) Define Magnetic domains. Explain ferromagnetic on the basis of domain theory.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the structure of diamond with a neat diagram.

17. (a) Describe the lattice thermal conductivity and umklapp processess.

    (b) Explain the vibrations of mono atomic laltices.

18. (a) Explain the effect of temperature on the Fermi-Dirac distribution.

    (b) Discuss the crystal momentum of an electron energy bands in metals.

19. (a) Determine the expression for paramagnetic susceptibility of conduction electrons.

    (b) Explain the adiabatic demagnetization.

20. (a) Explain the experimental and theoritical survey of superconductors.

    (b) Describe the cryoelectronics.

———————

F–9397

Sub. Code
7MPH2C2

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Physics

MATHEMATICAL PHYSICS – II

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. Write down the Laplace transform of $F(t) = Sinat$.

2. Give the boundary value problem of Laplace transform.

3. Give the partial differential equation for vibrating string.

4. Write a note on separation of values.

5. Define summation convention.

6. Write an example for metric tensors.

7. Define subgroup.

8. Give the properties of isomorphism.

9. Show that $H_n(-x) = (-1)^n H_n(x)$.

10. Write down the generating function for Legendre polynomial.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Find the Laplace transforms of $Sin\sqrt{t}$.

Or

(b) Obtain the Laplace transform of $e^{-t}\cos t$.

12. (a) Deduce the heat conducting equations using partial differential equations.

Or

(b) Derive the general solution to boundary value problem.

13. (a) Describe covariant and Contravariant tensor.

Or

(b) Show that symmetry properties of a tensor are invariant.

14. (a) Elucidate the elementary properties of group.

Or

(b) Construct the C_{2v} character table.

15. (a) Discuss about generating function of hermibe polynomial.

Or

(b) Obtain the Rodigue's formula for Laguerre polynomial.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Obtain inverse Laplace transform of $\frac{5S-6}{S^2+9}$.

17. Derive the partial differential equation for Longitudinal and transverse vibration of a beam.

18. Prove that the Kronecker delta is a mixed tensor of rank two.

19. Find all the permutations of four letters a, b, c, d which leave the expression $ab+cd$ invariant.

20. Solve the Legendre differential equation and prove that if $P_n(x)$ is a solution of the equation then $P_n(-x) = (-1)^n P_n(x)$.

F–9398

Sub. Code
7MPH2C3

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Physics

ELECTROMAGNETIC THEORY

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define electric field.
2. Write down the Poisson and Laplace equation.
3. State Biot – Savart law.
4. Define permeability.
5. Define Lorentz gause.
6. State poynting theorem.
7. State Fresnel's law.
8. Define group velocity.
9. What is thomson scattering?
10. Define dispersion.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Elucidate the potential of a localized charge distribution.

Or

(b) Obtain the energy in an electric field.

12. (a) Explain the applications of Biot – Savart law.

Or

(b) Discuss the charged particle in the magnetic field.

13. (a) Derive the energy in the magnetic field.

Or

(b) Outline Dirac quantization condition.

14. (a) Describe the reflection of electromagnetic waves at a plane interface between dielectric.

Or

(b) Write a short note on transmission lines.

15. (a) Explain the radiation of a localized oscillating source.

Or

(b) Elucidate the dispersion in liquids.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Apply electrostatic boundary conditions to solve boundary value problems in Cartesian coordinates.

17. Explain multipole expansion of Vector potential.

18. Obtain Maxwell's equations in free space and in linear isotropic media.

19. Explain the waves in a dissipative medium.

20. Discuss the scattering by a bound electron.

———————

F–9399

Sub. Code
7MPH2C4

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Physics

QUANTUM MECHANICS – II

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What do you mean by time dependent perturbation theory?

2. Give the conditions for adiabatic approximation.

3. Define differential cross – section.

4. What is Phase shift?

5. What are Einstein's coefficients?

6. Define density matrix.

7. State current density.

8. What are negative energy states?

9. What is a Lagrangian density?

10. What is a number operator?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) State and explain Fermi Golden rule.

Or

(b) Write a brief note on Adiabatic approximation.

12. (a) Derive an expression for differential cross section of a particles by a coulomb potential.

Or

(b) Describe the validity condition for Born approximation.

13. (a) Differentiate spontaneous and Induced emission of radiation.

Or

(b) Write note on Density matrix.

14. (a) Describe probability density and current density.

Or

(b) Show that the Dirac matrices are even dimensional.

15. (a) Quantize the electromagnetic field in the absence of the charge and currents. Hence obtain the Hamiltonian density of the field.

Or

(b) Explain anticommutation relations.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the first order time dependent perturbation theory.

17. Explain the method of partial waves to calculate the phase shifts and scattering amplitude.

18. What are Einstein's A and B coefficients? State the relation between the two.

19. Solve the Dirac's equation for a particle in central field force and calculate spin orbit coupling energy.

20. Derive classical Lagrangian equation.

———————

F–9400	Sub. Code
	7MPH3C3

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Third Semester

Physics

ADVANCED ELECTRONICS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Write any two applications of LASER Diode.

2. Compare BJT and JEET.

3. What is CMMR?

4. Mention the concept of virtual ground?

5. What is the function of flip flop in an logic circuit?

6. How does EPROM retain memory?

7. What is the principle of crystal oscillator?

8. What is the need of Analog to digital and Digital to analog conversion?

9. What is single side band technique?

10. Compare Gunn and Tunnel diode.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain V-I characteristics of varactor diode.

Or

(b) Describe the action of bipolar junction transistor.

12. (a) Give the characteristics of ideal OP-Amp.

Or

(b) Explain band pass and band reflection fillers.

13. (a) Explain the operations of DTL and TTL.

Or

(b) Write a note on charged coupled devices.

14. (a) Give the applications of IC 555 Timer and draw its schematic diagram.

Or

(b) With suitable diagram explain convention in R-2R Ladder DAC.

15. (a) Discuss mathematical representation of frequency modulation.

Or

(b) Write note on magnetron and klystron.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain V-I characteristics of SCR and TRIAC.

17. Describe OP-Amp perform as log and Antilog amplifier.

18. Describe the operation of RS and JK flip flops.

19. With suitable diagram explain the action of dual slope ADC.

20. Explain the theory of amplitude modulation and also derive voltage equation of amplitude modulated waves.

———————

F–9401

Sub. Code
7MPHE3A

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Physics

Elective – NANO SCIENCE

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define crystal lattice.

2. What is the use of the de Broglie wavelength in nanotechnology?

3. What do you mean by nanomaterials?

4. What are natural nanoparticles?

5. Name the different forms of carbons.

6. Give any two uses of nanotubes.

7. What do you mean by photons?

8. What are photonic crystals?

9. What are quantum computers?

10. What is nanoelectronics?

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Discuss the scientific revolutions of nanotechnology.

Or

(b) Write an account of molecules and phases.

12. (a) Describe the working of ball milling technique.

Or

(b) Discuss the construction and working of electro-deposition.

13. (a) List the properties of carbon nanotubes.

Or

(b) Write five applications of nanotubes.

14. (a) Discuss briefly the challenges of nanotechnology.

Or

(b) List out the applications of photonic crystals.

15. (a) Write notes on

(i) Nanoelectronics.

(ii) Quantum electronic devices.

Or

(b) Describe micro and nano fabrication technology.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Write short notes on

    (a) Types of nanotechnology.

    (b) Surface and dimensional spaces.

17. Explain the principle and synthesis of nano particles by sol-gel technique.

18. Describe the self-assembled monolayers.

19. Explain the two dimensional photonic crystal and the photonic band gap of photonic crystals.

20. Discuss about the experimental implementation of quantum computers.

———————

F–9402

Sub. Code
7MPHE3B

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Physics

Elective – ANALYTICAL INSTRUMENTION

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State the frequency range of UV-V is spectra.

2. Mention use of filters in UV absorption photometry.

3. What do you understand by photographic detection?

4. Mention the features of FT- Interferometer.

5. Expand: ESCA.

6. Write the role of SEM.

7. What is laser?

8. Give example for Laser source.

9. What is FES?

10. Give any two comparison of FEs and AAs

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Describe the absorption spectrophotometry.

Or

(b) Outline the instruments used for absorption photometry.

12. (a) Discuss the atomic emission spectrometer.

Or

(b) Elucidate the features of FT-interferometer.

13. (a) Enumerate the X-ray fluorescence Spectrometer.

Or

(b) Write a short note on sample handling.

14. (a) Discuss the principles of NMR.

Or

(b) Describe the working of SEM.

15. (a) Discuss the flame emission spectrometry.

Or

(b) Give brief account on AFS.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Explain the working principle of IR spectrophotometer.

17. Describe the photographic and photoelectric detection.

18. Discuss the Laser Raman spectrometer.

19. Explain the working of continuous wave NMR spectrometer.

20. Discuss the atomic absorption spectrometry.

F–9403

Sub. Code
7MPHE4A

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Physics

Elective – THERMODYNAMICS AND STATISTICAL PHYSICS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Define Entropy.

2. State second law of thermodynamics.

3. What is Transport Phenomena?

4. Give the relation between mean free path and absolute temperature.

5. Define statistical equilibrium.

6. Differentiate micro and macro states.

7. Write the expression of Sacker–Tetrode equation.

8. What are symmetric and antisymetric wave functions?

9. What is meant by Photons?

10. Write the special properties of liquid Helium.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Derive Vander Waals equation of state.

Or

(b) Calculate changes the entropy in reversible processes.

12. (a) Derive Boltzmann transport equation.

Or

(b) Write note on Brownian motion.

13. (a) State and prove Liouville's theorem.

Or

(b) Discuss about canonical and grand canonical ensembles.

14. (a) Discuss the postulates of Quantum statistical mechanics

Or

(b) Derive Fermi-Dirac distribution law of statistics.

15. (a) Give the properties of ideal fermigas.

Or

(b) State and explain Debye's theory.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Derive the relation between Gibbs and Helmholtz functions.

17. Define mean free path and show the relation between mean free path and temperature of gas.

18. Derive the expression for speeds of molecules from maxwell's distribution law.

19. Derive the expression for Bose-Einstein distribution law.

20. Discuss about pauli's theory of paramagnetism.

———————

F–9404

Sub. Code
7MPHE4B

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Physics

Elective – COMMUNICATION ELECTRONICS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What is the bandwidth required for an amplitude modulated signal?

2. What is radiation resistance?

3. Why is ASK called as ON-OFF keying?

4. How does data modulation differ from PCM?

5. Make a clear distinction between velocity modulation and current modulation.

6. What are Gunn domains? How are they found?

7. What are the types of linear scattering losses?

8. What is meant by dispersion in optical fiber?

9. What are the conditions required for an orbit to be Geostationary?

10. State the basic constituents of a cellular system.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain the difference between driven and parasitic elements in an antenna array.

Or

(b) Write a note on non-resonant antenna.

12. (a) Describe the operation frequency shift keying modulation.

Or

(b) Describe with neat diagram, the operation of a QPSK modulator.

13. (a) Describe the reflex klystron oscillator with the aid of a suitable schematic diagram.

Or

(b) Explain the working principle of IMPATT diode.

14. (a) Explain the acceptance angle and numerical aperture of an optical fiber and derive expressions for both.

Or

(b) Explain with neat diagram the elements of an optical fiber transmission link.

15. (a) Discuss about frequency allocations for satellite services.

Or

(b) Explain about the handoff and power control.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the various types on internal noise and external noise in communication system.

17. Explain the operation of frequency and time division multiplexing system.

18. Draw a functional block diagram of a pulsed radar set, and describe the function of each block.

19. What are the losses on signal attenuation mechanisms in a fiber? Explain.

20. Elucidate the three basic multiple access methods currently use in cellular systems.

———————

F–9405	Sub. Code
	7MPHE5A

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Physics

Elective – ENERGY AND ENVIRONMENTAL PHYSICS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. How does pressure vary with height?

2. Differentiate weather from climate.

3. Name the two instruments used for solar radiation measurement.

4. How flat plate solar collectors are divided?

5. When does gasification occur?

6. Why Biogas is called as Gobar gas?

7. How storage of Hydrogen is easier compared to that of gasoline?

8. Why Hydrogen is called as a secondary source?

9. Name four hazardous air pollutants.

10. When land breeze will occur?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Brief temperature and density variations with height.

Or

(b) Explain hydrostatic equilibrium.

12. (a) Estimate the daily global radiation on a horizontal surface at Baroda (22°13'N, 73°13'E) during March. If a = 0.28 and b = 0.48 and the average sunshine hours for the day are 9.5.

Or

(b) Brief the three types of thermal losses in a flat plate collector.

13. (a) List the factors affecting biodigestion.

Or

(b) Describe the advantages and disadvantages of fixed dome plant.

14. (a) Mention the various safety factors relevant to use hydrogen as a fuel.

Or

(b) How Hydrogen is used to produce electricity?

15. (a) Explain the quality standards of air.

Or

(b) Brief puffs and plumes.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. (a) Brief Raynold transport theorem.

    (b) Explain Green house effect.

17. Describe the thermal analysis of a flat plate collector.

18. Give an account on photosynthesis.

19. Write a note on Hybrid batteries.

20. Brief purification and control devices of air pollution.

———————

F–9406

Sub. Code
7MPHE5B

M.Sc. DEGREE EXAMINATION, APRIL 2023.

Fourth Semester

Physics

Elective – MEDICAL PHYSICS

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. What is an Alveoli?

2. Expand ERG and EOG.

3. What is meant by percussion effect?

4. What is meant by deafness? Why does it occur?

5. What is ultraviolet light?

6. Why vision is colour? Name the elements corresponding to that.

7. What is the use of fluoroscopy?

8. Define Red and gray.

9. What is meant by heart sounds?

10. Where defibrillators are useful?

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Brief the physics of some common lung diseases.

Or

(b) Explain the electric signals from heart.

12. (a) List the general properties of sound.

Or

(b) Describe sensitivity of the ears.

13. (a) How infrared light is useful in medicine?

Or

(b) Brief the role of retina in vision.

14. (a) How the live X-ray in ages are produced?

Or

(b) Brief the principles of radiation therapy.

15. (a) Write a note on cardiovascular diseases.

Or

(b) Describe Bernoulli's principle.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Write a note on

(a) Magneto cardiogram.

(b) Magneto Encephalogram.

17. Brief

    (a) Stethoscope.

    (b) Hearing aids.

18. Explain the role of LASER in medicine and list the applications of microscopes in medicine.

19. Describe

    (a) X-ray production.

    (b) Absorption of X-rays.

20. Explain the measurement of blood pressure.

———————