

Mayiladuthurai District
Revision Examination-2

Std:12

Max.Marks : 70

Sub: PHYSICS

Time: 3 Hrs

Instructions:

- (1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the hall supervisor immediately.
- (2) Use **Blue or Black ink** to write and underline Use pencil to draw diagrams.

PART I

Answer All questions.

15 x 1 = 15

Choose the most appropriate answer from the given.
Write the option code with corresponding Answer.

1. The zener diode is primarily used as
 - a. Rectifier
 - b. Amplifier
 - c. Oscillator
 - d. Voltage Regulator
2. If the nuclear radius of ^{27}Al is 3.6 fermi, the approximate nuclear radius of ^{64}Cu in fermi is
 - a. 2.4
 - b. 1.2
 - c. 4.8
 - d. 3.6
3. As the electron in Bohr's Orbit of hydrogen atom passes (jumps) from state $n = 2$ to $n=1$, the KE (K) and the potential energy (U) changes as follow
 - a. K is four fold and U also four fold
 - b. K two fold and U also two fold
 - c. K four fold and U two fold
 - d. K two fold and U four fold
4. An air bubble in glass slab of refractive index(near normal incidence)is 5cm deep when viewed from one surface and 3cm deep when viewed from opposite face. The thickness of the slab is
 - a. 8 cm
 - b. 10cm
 - c. 12cm
 - d. 16cm
5. A non conducting charged ring carrying a charge of q , mass m and radius r is rotated about its axis with constant speed ω Find the ratio of its magnetic moment with angular momentum is
 - a. q/m
 - b. $2q/m$
 - c. $q/2m$
 - d. $q/4m$

6. An electric current passes through a long straight copper wire, at a distance of 5cm from the straight wire, the magnetic field B. the magnetic field at 25cm from the straight wire would be

- a. $B/6$
- b. $B/5$
- c. $B/3$
- d. $B/2$

7. An electric field $E = 10x\hat{i}$ exists in a certain region of space. Then the potential difference $V = V_0 - V_A$ where V_0 is the potential at $x = 2\text{m}$ is

- a. 10V
- b. -20V
- c. +20V
- d. -10V.

8. The capacitance of a parallel plate capacitor is $60\ \mu\text{F}$ If the distance between the plates is tripled and the area doubled then the new capacitance will be

- a. $10\ \mu\text{F}$
- b. $40\ \mu\text{F}$
- c. $80\ \mu\text{F}$
- d. $100\ \mu\text{F}$

9. Two identical cells send the same current is 2ohm resistance whether connected in series or in parallel, find the internal resistance of the cell should be

- a. $1\ \Omega$
- b. $2\ \Omega$
- c. 0.5
- d. $2.5\ \Omega$

10. In India electricity is supplied for domestic use at 220V. It is supplied at 110v in USA. If the resistance of a 60W bulb for use in India is R, the resistance of a 60W bulb for use in USA will be

- a. R
- b. 2R
- c. $R/4$
- d. $R/2$

11. The flux linked with a coil at any instant t is given by $\phi_B = 10t^2 - 50t + 250$. The induced emf at $t = 3\text{s}$ is

- a. -190V
- b. -10V
- c. 10V
- d. 190V

12. A ray of light strikes a glass plate at an angle 60° . If the reflected and refracted rays are perpendicular to each other the refractive index of the glass is

- a. $\sqrt{3}$
- b. $3/2$
- c. $\sqrt{3}/2$
- d. 2

13. In an electromagnetic wave travelling in free space the rms value of the electric field is $3\ \text{Vm}^{-1}$. The peak value of the magnetic field is

- a. $1.414 \times 10^{-8}\text{T}$
- b. $1.0 \times 10^{-8}\text{T}$
- c. $2.828 \times 10^{-8}\text{T}$
- d. $2.0 \times 10^{-8}\text{T}$

14. 'Ski wax' is an application of nano product in the field of

- a. Medicine
- b. Textile
- c. Sports
- d. Automobile industry

15. The threshold wavelength for a metal surface whose photoelectric work function is 3.313 eV is

- a. 4125 \AA b. 3750 \AA c. 6000 \AA d. 2062.5 \AA

PART II

Answer any six questions Q.No 24 is compulsory

6 x 2 = 12

16. State Gauss's law in electrostatics
17. State de Broglie hypothesis
18. How current sensitivity of a galvanometer can be increased?
19. What are LC oscillations?
20. What are Fraunhofer lines? State its importance.
21. Write any two properties of Neutrino
22. State the conditions for Total internal reflection take place.
23. Write any four uses of polaroids
24. What is the value of x when the Wheatstone's network is balanced?
 $P=500\Omega$ $Q=800\Omega$ $R=x+400\Omega$ $S=1000\Omega$

PART III

Answer any six questions Q.No 33 is compulsory

6 x 3 = 18

25. State any three applications of capacitors.
26. What is a photo cell? Mention any two uses
27. Give the properties of magnetic field lines?
28. Derive the relation for power $P=VI$ in electrical circuit
29. Derive the relation between f and R for a spherical mirror.
30. State and prove Brewster's law in terms of polarisation by reflection.
31. Mention the three important inferences from the average binding energy of the nucleons and Mass number.
32. What is Transistor biasing? Mention its types

33. A 400mH coil of negligible resistance is connected to an AC circuit in which an effective current of 6mA is flowing. Find out the voltage across the coil if the frequency is 1000Hz.

PART IV

Answer All questions.

Draw diagram wherever necessary

5 x 5 = 25

- 34 (a) Derive an expression for electric field intensity due to an electric dipole at a point on its axial line. (OR)
- (b) Obtain an expression for the force on a current carrying conductor placed in a magnetic field
35. (a) What are electromagnetic waves? Mention any four properties of electromagnetic waves (OR)
- (b) Obtain the equation for band width in Young's double slit experiment.
36. (a) Explain the spectral series of an Hydrogen atom (OR)
- (b) What is electron emission? Explain briefly various methods of electron emission.
- 37(a) Derive the equation for angle of deviation produced by a prism and thus obtain the equation for refractive index of material of the prism (OR)
- (b) State and prove De Morgan's first and second theorem with truth table and its corresponding logic circuit diagram.
- 38.(a) Explain the principle, construction and working of a transformer with diagram. (OR)
- (b) Explain the equivalent resistance of a series and parallel resistor network