STD: XII
Time Allowed: 3.00 Hrs.

REVISION EXAMINATION – 1
PHYSICS
PART - I

Maximum Marks: 70

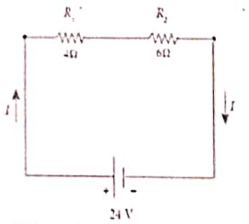
Note: i) Answer all the questions. 15 X 1 = 15
ii) Choose the most suitable answer and write the code with corresponding answer.

1. An electric dipole with dipole moment $\vec{p} = (3\hat{\imath} + 4\hat{\jmath})Cm$ is kept in electric field $\vec{E} = (0.4\hat{\imath})NC^{-1}$. What is the potential energy of dipole?
   a) $2.8J$ b) $-1.2J$ c) $1.2J$ d) $-2.8J$
2. Masses of the three wires of same material are in the ratio of 1:2:3 and their lengths in the ratio of 3:2:1. Electrical resistance of these wires will be in the ratio of
   a) 1:1:1 b) 1:2:3 c) 9:4:1 d) 27:6:1
3. The ratio of intensities of magnetic field in the axial and equatorial positions of a magnet will be
   a) 1:4 b) 4:1 c) 1:2 d) 1:2
4. In LCR circuit, the power dissipation is through
   a) R b) L c) C d) all L, C and R
5. Two Polaroids are kept crossed to each other. Now one of them is rotated through an angle of 45°. The percentage of incident light now transmitted through the system is
   a) 15% b) 25% c) 50% d) 60%
6. The ratio of half life and mean life of radioactive sample is
   a) $ln2$ b) 1 c) $\frac{1}{ln2}$ d) $\frac{1}{2ln2}$
7. In an n-p-n transistor circuit, the collector current is $10mA$. If 90% of the electrons emitted, reach the collector, the emitter current (I_E) and base current (I_B) are given by
   a) $I_E = 1mA, I_B = 11mA$ b) $I_E = 11mA, I_B = 1mA$
   c) $I_E = -1mA, I_B = 9mA$ d) $I_E = 9mA, I_B = -1mA$
8. The radius of curvature of curved surface at a thin planoconvex lens is 10 cm and the refractive index is 1.5. If the plane surface is silvered, then the focal length will be,
   a) 5 cm b) 10 cm c) 15 cm d) 20 cm
9. The blue print for making ultra durable synthetic material is mimicked from
   a) Lotus leaf b) Morpho butterfly c) Parrot fish d) Peacock feather
10. In a hydrogen atom, the electron revolving in the fourth orbit, has angular momentum equal to
    a) h b) $\frac{h}{\pi}$ c) $\frac{4h}{\pi}$ d) $\frac{2h}{\pi}$
11. The threshold wavelength for a metal surface whose photoelectric work function is 3.313 eV is
    a) $4125\dot{A}$ b) $3750\dot{A}$ c) $6000\dot{A}$ d) $2062.5\dot{A}$
12. The light emitted in an LED is due to
    a) Recombination of charge carriers b) Reflection of light due to lens action
    c) Amplification of light falling at the junction d) Large current capacity.
13. If voltage applied on a capacitor is increased from V to 2V, choose the correct conclusion.
    a) Q remains the same, C is doubled b) Q is doubled, C doubled
    c) C remains same, Q doubled d) Both Q and C remain same
14. In an electromagnetic wave in free space the rms value of the electric field is 3 V m^{-1}. The peak value of the magnetic field is .....
    a) 1.414×10^{-8} T b) 1.0×10^{-8} T c) 2.828×10^{-8} T d) 2.0×10^{-8} T
15. A thin insulated wire forms a plane spiral of N = 100 tight turns carrying a current I = 8 m A (milli ampere). The radii of inside and outside turns are a = 50 mm and b = 100 mm respectively. The magnetic induction at the center of the spiral is
    a) 5 μT b) 7 μT c) 8 μT d) 10 μT

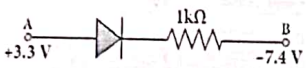
PART – II

Answer any six questions. Question No.24 is compulsory. 6 X 2 = 12

16. How will you define Q-factor?
17. What is displacement current?
18. What are the properties of an equi- potential surface?
19. Calculate the equivalent resistance for the circuit which is connected to 24 V battery and also find the potential difference across each resistors in the circuit



20. Why does sky appear red in colour during sunrise and sunset?
21. Differentiate between Fresnel and Fraunhofer diffraction.
22. Define stopping potential.
23. What is binding energy of a nucleus? Give its expression.
24. A silicon diode is connected with 1kΩ resistor as shown. Find the value of current flowing through AB



PART – III

Answer any six questions. Question No. 33 is compulsory. 6 X 3 = 18

25. List out the advantages and limitations of frequency modulation.
26. Write a note on Silvered lenses.
27. Derive an expression for de Broglie wave length of electrons.
28. Discuss about astronomical telescope.
29. Derive an expression for electrostatic potential due to a point charge.
30. Explain the equivalent resistance of a series network.
31. State and explain Bio-savart-law.
32. Obtain the expression for motional emf from Lorentz force.
33. Show that the mass of radium $\left(^{226}_{88}Ra\right)$ with an activity of 1 curie is almost a gram.
    Given $T_{1/2}$=1600 years.

PART – IV

Answer all the questions. 5 X 5 = 25

34 a) How the emf of two cells are compared using potentiometer? (OR)
   b) Write down Maxwell equations in integral form.

35 a) Sketch the static characteristics of a common emitter transistor and bring out the essential features of input and output characteristics. (OR)
   b) i) Obtain the expression for capacitance for a parallel plate capacitor.
   ii) Obtain the expression for energy stored in the parallel plate capacitor.

36 a) Discuss the diffraction at a grating and obtain the condition for the m^{th} maximum. (OR)
   b) Obtain Einstein's photoelectric equation with necessary explanation.

37 a) Derive the expression for the force on a current carrying conductor in a magnetic field. (OR)
   b) Obtain the law of radioactivity.

38 a) Elaborate the working of a single phase AC generator with necessary diagram. (OR)
   b) Derive the equation for angle of deviation produced by a prism and thus obtain the equation for refractive index of material of the prism.