12 - Std SECOND REVISION TEST PHYSICS 1 2 2 2 Y

Time : 3.00 Hrs Marks : 70

PART - I

Note : (i) Answer all the questions . (ii) Choose the most appropriate answer from thegiven four alternates and write the option code and the corresponding answer. **15 X 1 = 15**

1. A parallel plate capacitor stores a charge Q at a voltage V. Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change ?
   a) Capacitance b) Charge c) Voltage d) Energy density
2. Which of the following is an electromagnetic waves ?
   a) X-ray b) IR-ray c) gamma ray d) all of these
3. In a series RL circuit, the resistance and inductive reactance are the same. Then the phase difference between the voltage and current in the circuit is
   a) $\frac{\pi}{4}$ b) $\frac{\pi}{6}$ c) $\frac{\pi}{2}$ d) zero
4. A toaster operating at 240 V has a resistance of 120Ω. Its power is
   a) 400 W b) 2 W c) 240 W d) 480 W
5. The vertical component of Earths magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place ?
   a) 90° b) 60° c) 45° d) 30°
6. A dipole is placed in a uniform electric field with its axis parallel to the field, it experiences
   a) Only a net force b) only a torque c) both a net force and torque
   d) neither a net force nor a torque
7. The rms value of an AC voltage with a peak value of 311 V is
   a) 100 V b) 220 V c) 50 V d) 70.7 V
8. The particle which gives mass to protons and neutrons are,
   a) Bulk particle b) Nano particle c) Higgs particle d) Einstein particle
9. If the nuclear radius of ^{64}Cu is 4.8 fermi, the approximate nuclear radius of ^{27}Al in fermi is
   a) .4 b) 1.2 c) 4.8 d) 3.6
10. The barrier potential of a Germanium diode is approximately
    a) 0.7 V b) 0.3 V c) 2.0 V d) 1.1 eV
11. Stars twinkle due to
    a) refraction b) total internal reflection c) reflection d) polarisation
12. In a young' s double slit experiment, the slit separation is halved. To maintain the same fringes spacing on the screen, the screen to slit distance 'D' must be changed to,
    a) 2D b) D/2 c) $\sqrt{2}\,D$ d) $D/\sqrt{2}$
13. Emission of electron by the absorption of heat energy is called —— emission
    a) field b) photoelectric c) secondary d) thermionic
14. The ratio between the radius of first three orbits of hydrogen atom is,
    a) 1 : 2 : 3 b) 2 : 4 : 6 c) 3 : 4 : 1 d) 1 : 4 : 9

15. When an electron is accelerated with potential difference 'V' its de Broglie wavelength is directly proportional to

a) V b) V^{-1} c) $V^{\frac{1}{2}}$ d) $V^{-\frac{1}{2}}$

PART -II

Note : Answer any six questions. Question No 24 is compulsory : 6*2=12

16. What is corona discharge ?
17. State Ampere's circuital law ?
18. Mention the ways of producing induced emf ?
19. Give four uses of IR radiation ?
20. What is the reason for reddish appearance of sky during sunset and sunrise ?
21. The ratio of maximum and minimum intensities in an interference pattern is 36 : 1 . What is the ratio of the amplitude of the two interfering waves ?
22. Define : Threshold frequency.
23. Give the Barkhausen conditions for sustained oscillations?
24. The radius of the 3rd orbit of hydrogen atom is 4.761 A°. Calculate the de Broglie wavelength of the electron orbiting in the 3rd orbit.

PART -III

6 x 3 = 18

Note : Answer any six questions. Question No 33 is compulsory :

25. Derive an expression for resultant capacitance, when capacitors connected in parallel ?
26. State Kirchhoff's current rule and Voltage rule ?
27. Discuss the conversion of galvanometer into a voltmeter ?
28. The equation for an alternating current is given by I = 77 sin 314t. Find the peak current, frequency and time period.
29. State and obtain Brewster's law ?
30. List out the characteristics of photons.
31. Give the symbolic representation of alpha, beta and gamma emission.
32. Draw the circuit diagram, input and output waveform of full wave rectifier.
33. Find the ratio of the intensities of light with wavelength 500 nm and 300 nm which undergo Rayleigh scattering.

PART – IV

Note : Answer all the questions : **5 x 5 = 25**

34. (a) Calculate the electric field due to a dipole on its axial line ***(OR)***
(b) Transistor functions as a switch. Explain.
35. (a) Explain the determination of the internal resistance of a cell using voltmeter.
(OR) (b) Explain the J J Thomson experiment to determine the specific charge of an Electron
36. (a) Derive the expression for the force between two parallel current carrying conductors. ***(OR)***
(b) (i) Derive an expression for de Broglie wavelength of an electron.
(ii) Calculate the momentum of an electron with kinetic energy 2 eV.
37. (a)Explain the principle, construction and working of transformer. ***(OR)***
(b) Discuss the diffraction at single slit and obtain the condition for n^{th} minimum.
38. (a) What is absorption spectrum. Explain the types of absorption spectrum
(OR) (b) Derive the mirror equation and the equation for lateral magnification.