V12P

Virudhunagar District Common Examinations
Second Revision Test - February 2023

01-2012

Standard 12

PHYSICS

Time Allowed: 3.00 Hours | Maximum Marks: 70

PART - I

Note: 1. **Answer all the questions.** **15×1=15**
2. **Choose the correct answer and write the option code and the corresponding answer.**

1) Stars twinkle due to
a) Reflection b) Total internal reflection
c) Refraction d) Polarisation

2) To obtain sustained oscillation in an oscillator
a) feed back should be positive b) loop gain must be unity
c) phase shift must be 0 and integral multiplies of 2π
d) all the above

3) The materials used in Robotics are
a) Aluminium and Silver b) Silver and Gold
c) Copper and Gold d) Steel and Aluminium

4) The potential energy of magnetic dipole whose dipole moment is $\vec{p} = (-0.5\,\hat{i} + 0.4\,\hat{j})\ Am^2$ kept in uniform magnetic field $\vec{B} = 0.2\hat{i}\,T$ is
a) −0.1J b) −0.8J c) 0.1J d) 0.8J

5) In an oscillating LC circuit, the maximum charge on the capacitor is Q. The charge on the capacitor is Q. The charge on the capacitor when the energy is stored equally between the electric field and magnetic field is
a) $Q/2$ b) $Q/\sqrt{3}$ c) $Q/\sqrt{2}$ d) Q

6) The work functions for metals A, B and C are 1.92 eV, 2eV and 5eV respectively. The metals which will emit photo electrons for the radiation of wavelength 4100Å is/are
a) 'A' only b) Both 'A' and 'B' c) All these metal d) None of these

7) If the amplitude of the magnetic field is 3×10^{-6}J, then amplitude of the electric field for a electro magnetic wave is
a) 100 Vm^{-1} b) 300 Vm^{-1} c) $900\sqrt{2}$ Vm^{-1} d) 900 Vm^{-1}

8) A toaster operating at 240V has a resistance of 120Ω. Its power is
a) 400W b) 2W c) 480W c) 240W

9) A step-down transformer reduces the supply voltage from 220V to 11V and increase the current from 6A to 100A. Then its efficiency is
a) 1.2 b) 0.83 c) 0.12 d) 0.9

10) The path difference and phase difference between two interfering waves interference are respectively for destructive
a) $\lambda, 3\pi$ b) $0, \lambda$ c) $\pi, \lambda/2$ d) $\lambda/2, \pi$

11) The current sensitivity of moving coil galvanometer is 10^6 div.A^{-1} and voltage sensitivity is 2×10^3 div.V^{-1}. The resistance of the galvanometer.
a) 500Ω b) 5KΩ c) $2\times10^{-3}\Omega$ d) Zero

12) The unit of magnetic susceptibility is
a) Tesla b) Hm^{-1} c) Jm^{-1} d) dimensionless

13) A concave mirror of focal length of produces an image n times the size of the object. If the image is real then the distance of the object from the mirror is
a) (n+1)f b) $\frac{(n+1)f}{n}$ c) $\frac{(n-1)f}{n}$ d) (n−1)f

14) What is the half-time of a radioactive sample (in minutes), if its mean life is 200s?
a) 0.69 min b) 2.31 min c) 2 min d) 2.57 min

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15) Relation between the current gains of a transistor 'α' and 'β' is

a) $\alpha = \frac{\beta}{1+\beta}$ b) $\alpha\beta = \beta - \alpha$ c) $\frac{1}{\alpha} - \frac{1}{\beta} = 1$ d) all the above

PART - II

Note: i) Answer any SIX of the following questions. **6×2=12**
ii) Question No. 24 is compulsory.

16) Define Electric flux. Give its unit.
17) State Joule's law of heating.
18) State Fleming's left hand rule.
19) An ideal inductor blocks AC. Why?
20) Give any two uses of micro waves.
21) Write the differences between polarised and unpolarised light.
22) How will you define threshold frequency?
23) Define Ionization potential.
24) In a transistor connected in the common base configuration $\alpha = 0.95$, $I_E = 1mA$, calculate the value of I_C and I_B.

PART - III

Note: i) Answer any SIX questions. **6×3=18**
ii) Question No. 33 is compulsory.

25) Write the properties of cathode rays.
26) Write short note on Thomson effect.
27) An electron moving perpendicular to a uniform magnetic field 0.500T undergoes circular motion of radius 2.50mm. What is the speed of electron?
28) List the uses of polaroids.
29) List out the advantages of frequency modulation.
30) An inductor of inductance L carries an electric current i, How much energy is stored while establishing the current in it?
31) UV light of wavelength 1800Å is incident on a Lithium surface whose threshold wavelength is 4965Å. Determine the maximum energy of the electron emitted.
32) What is optical path? Obtain the equation for optical path.
33) A parallel plate capacitor has square plates of side 5 cm and separated by a distance of 1mm. Calculate the capacitance of this capacitor. ($\varepsilon_0 = 8.85\times10^{-12}\ N^{-1}m^{-2}C^2$)

PART - IV

Note: Answer ALL the questions. **5×5=25**

34) Obtain the expression for electric field at a point on the axial line of an electric dipole.
(OR)
Show mathematically that the rotation of a coil in a magnetic field over one rotation induces an alternating emf of one cycle.

35) Obtain the condition for bridge balance in wheatstone's bridge.
(OR)
Explain the basic elements of communication system with the necessary block diagram.

36) Obtain the magnetic field at a point on the equatorial line of a bar magnet.
(OR)
Prove law of refraction using Huygen's principle.

37) Obtain the focal length of lenses in contact.
(OR)
Explain the J.J. Thomson experiment to determine the specific charge of an electron.

38) i) Obtain the expression for de-Broglie wavelength of electron accelerated through a potential difference.
ii) When light of wavelength 2200Å falls on copper surface, photo electrons are emitted from copper. If work function for copper is 4.65eV, find the stopping potential.
(OR)
i) Write down the properties of electromagnetic waves.
ii) The relative magnetic permeability of the medium is 2.5 and the relative electrical permitivity of the medium is 2.25. Compute the refractive index of the medium.
