Tsi12P

Tenkasi District
First Revision Examination - 2024

29-01-2024

Standard 12
PHYSICS
PART - A

Time: 3.00 Hours Marks: 70

I. Answer all the questions. **15x1=15**

1) An electric dipole is placed at an alignment angle of 30° with an electric field of 2×10^5 NC^{-1}. It experiences a torque equal to 8 Nm. The charge on the dipole if the dipole length is 1 cm is
a) 4 mc b) 8 mc c) 5 mc d) 7 mc

2) A radio active nucleus emits β particle then the mother nucleus and daughter nucleus are .....
a) Isotope b) Isotone c) Isobar d) Isomer

3) A wire connected to a power supply of 230 V has power dissipation P_1. Suppose the wire is cut into two equal pieces and connected parallel to the same power supply. In this case power dissination is P_2. The ratio $\frac{P_2}{P_1}$
a) 1 b) 2 c) 3 d) 4

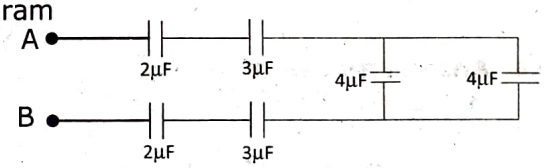
4) Current gain of the transister in common base mode is 0.999. Then what is the current gain in common emitter mode
a) 197 b) 201 c) 198 d) 199

5) A non-conducting charged ring of charge q mass m and radius r is rotated with constant angular 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) Criticle angle of a crystal is 45° then the angle of polarisation area
a) $\text{Sin}^{-1}\left(\frac{1}{2}\right)$ b) $\text{Cos}^{-1}\left(\frac{1}{2}\right)$ c) $\cos^{-1}\left(\sqrt{2}\right)$ d) $\tan^{-1}\left(\sqrt{2}\right)$

7) In a series resonant RLC circuit, the voltage across 100Ω resistor is 40V. The resonant frequency ω is 250 rad/s. If the value of C is 4 μF, then the voltage across L is
a) 600 V b) 4000 V c) 400 V d) 1 V.

8) What is the effective capasistance in between A and B (in μF) in given below diagram
a) $\frac{24}{23}$ b) $\frac{43}{24}$
c) $\frac{43}{12}$ d) 2



9) For light incident from air on a slab of refractive index 2, the maximum possible angle of refraction is,
a) 30° b) 45° c) 60° d) 90°

10) Ground state energy of hydrogen atom is −13.6 ev. Then the potential energy of electron in the same state.
a) 27.2 ev b) 13.6 ev c) 3.4 ev d) − 13.6 ev

11) If a light of wavelength 330nm is incident on a metal with work function 3.55 ev, the electrons are emitted. Then the wavelength of the emitted electron is (Take $h=6.6 \times 10^{-34}$ JS)
a) $< 2.75 \times 10^{-9}$ m b) $\geq 2.75 \times 10^{-9}$ m
c) $\leq 2.75 \times 10^{-12}$ m d) $< 2.5 \times 10^{-10}$ m

12) When the power loss is minimum for electric conductor?
a) Less potential with more current b) More potential with less current
c) More current and potential d) Less current and potential

13) The mass of a $^{7}_{3}Li$ nucleus is 0.042μ less than the sum of the masses of all its nucleons. The binding energy per nucleon of $^{7}_{3}Li$ nucleus is nearby
a) 46 MeV b) 5.6 MeV c) 3.9 MeV d) 23 MeV

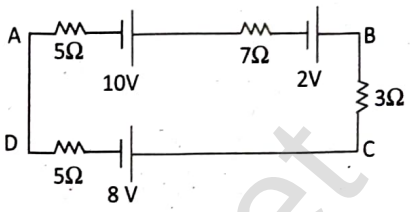
14) The technology used for stopping the brain from processing pain is
a) precision medicine b) wireless brain sensor
c) virtual reality d) Radiology

15) The frequency range of 3 MHz to 30MHz is used for
a) Ground wave propagation b) Spacewave propagation
c) Skywave propagation d) Satellite communcation

PART - B

II. Answer any 6 questions. Q.No. 24 is compulsory. **6x2=12**

16) Give two uses of capacitors.
17) Find the current and direction of current for the given circuit.



18) State Len's law
19) What is Doping?
20) Define Frehnel distance
21) What is Total internal reflexion?
22) Why the steel is used for making Robots
23) What is displacement current?
24) Find the minimum wavelength of X-ray with 1000 kv of x-ray tube.

PART - C

III. Answer any 6 questions. Q.No. 33 is compulsory. **6x3=18**

25) Give the uses of Internet
26) Find the effective capacitance of the capacitors connected in Parallel.
27) Explain How the Induced e.m.f produced by changing the area of the coil?
28) Write six properties of Electromagnetic waves
29) Why the Diomonds are glittering?
30) Give the uses of Polaroids.
31) Derive the expression for D-Broglie wavelength of electrons
32) Explain how the Galvanometer can be converted into Ammeter.
33) Calculate the number of nuclei of Carbon -14 undecayed after 22,920 years. If the initial number of Carbon - 14 atoms is 10,000. The half-life of carbon - 14 is 5730 years.

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PART - D

IV. Answer all the questions. **5x5=25**

34) Derive the Mirror - Equation.

(OR)

How will you find in internal resistance of the cell using voltmeter.

35) What is spectrum? Explain the types of emission specturm.

(OR)

Obtain Einstein's photoelectric equation with necessary explanation.

36) Explain the construction and function of transformer.

(OR)

Explain the contruction and working of a full wave rectifier.

37) Find the electric field at a point due to the charged infinite length of wire using gauss law.

(OR)

Discuss about simple microscope and obtain the equations for magnification for near point focusing and normal focusing.

38) Obtain the expression for the force acting on the current carrying conductor placed inside the magnetic field.

(OR)

Discuss the spectral series of hydrogen atom.

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