JGi

JAIN COLLEGE

463/465, 18th Main Road, SS Royal, 80 Feet Road, Rajarajeshwari Nagar,
Bangalore - 560 098

Date: *SUBJECT: PHYSICS*

II PUC
Mock -I

Timings Allowed: 3 Hrs 15 Minutes   *Total Marks: 70*

GENERAL INSTRUCTIONS:
   ➢ **All parts are compulsory.**
   ➢ **Draw relevant diagram/figure wherever necessary.**
   ➢ **Numerical problems should be solved with relevant formula.**

PART-A

I Answer ALL the following questions: -   10x1=10
   1. Two point charges q_1, q_2 are such that $q_1q_2>0$. What is the nature of force between the charges?
   2. Which lamp has greater resistance 60W or a 100W lamp, when connected to the same supply?
   3. What is the resistance of an ideal ammeter?
   4. Give an example for diamagnetic substance.
   5. Write the principle of AC Generator.
   6. Name the electromagnetic radiation which is having high penetrating power.
   7. Define the term 'wave front'.
   8. Give the relation between half-life and decay constant.
   9. What are extrinsic semiconductors?
   10. Mention the bandwidth of digital signals.

PART-B

II Answer any FIVE of the following questions:-   5x2=10
   11. Give any two properties of charges.
   12. Calculate the angle of dip at a place where the horizontal and vertical components of the earth's magnetic field are equal.
   13. What are eddy currents? Mention one application.
   14. Mention the expression for frequency of LC oscillations and explain the terms used.
   15. Sun appears red during sunrise and sunset. Explain.
   16. Define Stopping potential and Work function for a metal.
   17. Give the circuit symbol and truth table for AND Gate.
   18. Draw the block diagram of an AM transmitter.

PART-C

III Answer any FIVE of the following questions:-   5x3=15
   19. With the help of a diagram, explain the principle behind the working of Van De Graff Generator.
   20. (a)What is the principle of Meter Bridge?
       (b)Mention two applications of potentiometer.
   21. Derive the expression for force acting on a conductor carrying current in a uniform magnetic field.
   22. Define the terms magnetization, magnetic intensity and magnetic permeability.
   23. Describe coil and coil experiment to demonstrate electromagnetic induction.
   24. With relevant diagram explain myopia and its correction.
   25. Give three experimental observations of Photoelectric effect.
   26. Differentiate between Extrinsic and Intrinsic semiconductors.

PART-D

IV Answer any TWO of the following questions:-   **2x5=10**

27. Derive the expression for electric intensity at a point (a) inside (b) outside
a hollow spherical shell using Gauss Law.
28. Derive the expression for equivalent emf and equivalent internal resistance when two different
cells are connected in parallel.
29. Derive the expression for magnetic field on the axis of a circular current loop using Biot-Savart's
law.

OR

Derive the expression for impedence in series using phasor diagram.

V Answer any TWO of the following questions:-   **2x5=10**

30. Obtain the relation between u, v, n and R for refraction at a spherical surface when a real object is
placed towards the convex surface.
31. What is binding energy curve? Draw the binding energy curve and explain its three features.
32. Draw the circuit diagram of an n-p-n transistor in CE mode; hence derive the expression for
voltage gain and current gain.

PART-E

VI Answer any THREE of the following questions:-   **3x5=15**

33. A parallel plate air capacitor consists of two plates each of area 0.01sq.m separated by a distance
of 0.1mm. It is charged to a potential of 50V. Calculate its capacitance, charge on it and energy
stored.
34. Three resistors of 3Ω,4 Ω,6 Ω are connected in parallel. The combination is connected in series
with a resistance of 1 Ω and a cell of emf 2V having an internal resistance of 2 Ω. Find the current
through 4 Ω resistor.
35. A source of alternating emf of frequency 50Hz is connected in series with a resistance of 200 Ω,
an inductance of 100mH and a capacitance of 30μF. Does the current lead or lag the emf and by
what angle?
36. In Young's double slit experiment, the distance between the two slits is 0.2mm and the distance
between the source and the screen is 0.3m. If light of wavelength 600nm is used, calculate
(a) the distance from the central point on the screen to the position at which the fifth bright fringe
is formed
(b) the path difference between the light waves forming the fifth bright fringe.
(c) the phase difference between the light waves forming the fifth bright fringe.
37. An electron transmission occurs from n=4 to n=2 level in hydrogen atom. Find the wavelength
of the emitted radiation if the energy of the electron in the ground state is -13.6eV. To which
series does the spectral line belong?

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