

PHYSICS

(Intermediate Part-II, Class 12th) 422 Paper II (Group – II)

Time: 2:40 Hours

SUBJECTIVE

Marks: 68

Note: Section I is compulsory. Attempt any three (3) questions from Section II.

(SECTION – I)

2. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- Do electrons tend to go to region of high potential or of low potential?
- Describe the force or forces on a positive point charge when placed between parallel plates with opposite and equal charges.
- Show that $\frac{1 \text{ volt}}{1 \text{ meter}} = \frac{1 \text{ newton}}{\text{coulomb}}$
- Write down four properties of electric field lines.
- Why the resistance of an ammeter should be very low?
- How can a current loop be used to determine the presence of a magnetic field in a given region of space?
- Write down two uses of CRO.
- What is a dead beat galvanometer?
- If you swallowed an α -source and a β -source, which would be the more dangerous to you? Explain why?
- What factors make a fusion reaction difficult to achieve?
- Define the terms "mass defect" and "binding energy".
- What are the functions of "moderator" and "control rods" in a nuclear reactor?

3. Write short answers to any EIGHT questions.

(2 x 8 = 16)

- Why does the resistance of a conductor rise with temperature?
- What are ohmic and non-ohmic conductors? Give examples.
- How does Rheostat work as variable resistor?
- Under which conditions electromagnetic waves are produced from a source? Explain.
- How does doubling the frequency affect the reactance of an inductor and a capacitor?
- Write down advantages and disadvantages of A.M and F.M.
- Discuss the mechanism of electrical conduction by holes and electrons in a pure semi-conductor element.
- Define Young's and Bulk modulus.
- What is meant by para, dia and ferromagnetic substances? Give examples for each.
- Why is the base current in a transistor very small?
- What is effect of forward and reverse biasing of a diode on the width of depletion region?
- Draw the symbol and truth table of NOR gate.

4. Write short answers to any SIX questions.

(2 x 6 = 12)

- Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?
- Write down two methods used for the production of induced emf.
- What is meant by back motor effect in generator?
- Which has lower energy quanta, radio waves or x-rays?
- Is it possible to create a single electron from energy? Explain.
- What is wave particle duality? Explain.
- Does the induced emf always act to decrease the magnetic flux through a circuit? Explain.
- What is meant by absorbed dose? Define its SI unit Gray (Gy).
- Write down the names of three different quarks along with the value of charge on each.

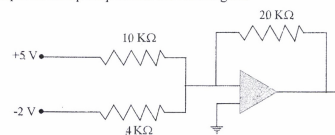
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(SECTION - II)

Note: Attempt any three (3) questions from Section II.

- What is electric potential? Find electric potential at a point due to a point charge. (5)
 - A rectangular bar of iron is 2 cm by 2cm in cross section and 40 cm long. Calculate its resistance if resistivity of iron is $11 \times 10^{-8} \Omega \text{ m}$. (3)
- Describe, how can we determine e/m ratio of an electron. (5)
 - A D.C motor operates at 240 V and has a resistance of 0.5 ohm. When the motor is running at normal speed, the armature current is 15 A. Find the back emf in the armature. (3)
- Draw the circuit diagram of (R-L-C) series resonance circuit. Discuss its behavior for A.C and also write down its properties. (5)
 - Calculate the output of the op-amp circuit shown in figure. (3)



- What is photoelectric effect? How its different results are successfully explained by Einstein? (5)
 - A 1.0 m long copper wire is subjected to stretching force and its length increases by 20 cm. Calculate the tensile strain and the percentage elongation which the wire undergoes? (3)
- What is inner shell transition? Explain the production of x-rays. (5)
 - A sheet of lead 5.0 mm thick reduces the intensity of a beam of γ -rays by a factor 0.4. Find half value thickness of lead sheet which will reduce the intensity to half of its initial value. (3)

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