PHYSICS-XII

SUPER STAR COACHING CENTRE

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House no 1552/A Ghosia colony Gulbahar No.2, Karachi

Guess paper XII

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SECTION C

1) Derive an expression for the pressure of an ideal gas in terms of its density and mean square speed.
2) What are Inertial and Non-inertial frame of reference? Also give the consequences of the special theory of relativity.
3) State Ampere's law. Use it to derive the relation for the magnetic field of induction B at any point inside a current carrying toroid..
4) State the basic postulates of Bohr's atomic theory of Hydrogen atom. Derive the expression for:
   (i) the radius of n^{th} orbit of Hydrogen atom. Hence, show that the ratio of radius of the third orbit to that of second orbit is 2.25.
   (ii) The energy of an electron in the n^{th} orbit of hydrogen atom.
5) What is meant by Capacitance of a Capacitor? Derive an expression for the Capacitance of parallel plate Capacitor. When there is
(i) Air between the plates.
(ii) Some dielectric medium between the plates.

Also prove that the ratio of both Capacitance is equal to dielectric constant ε_r.

6) Explain the function of the various parts of a moving coil Galvanometer and prove that the amount of current flowing is directly proportional to the angle of twist of the suspension.
7) What is Transformer? Write its types with the help of a clear diagram, give its construction and working and derive the relevant expression.
8) State Faraday's law of Electromagnetic induction. Explain Mutual induction and derive an expression for mutual inductance.
9) Describe Carnot Cycle. And derive an expression for the efficiency of Carnot heat engine.
10) What is Photoelectric effect? Explain its important results also derive Einstein's photoelectric equation.

SECTION B

1) Name a device for making the path of ionizing particles and rays visible and describe its working.
2) Derive an expression for the force experienced by a current-carrying conductor in a uniform magnetic field.
3) Define potential gradient. Derive mathematical relation between electric field intensity and potential difference.
4) What is Transistor? Why is it so called? Show diagrammatically the battery connection to PNP transistor and NPN transistor, for its normal working.
5) What is meant by laser, metastable state and population inversion..?
6) Explain Electric Flux. Under what condition is the flux the surface is (i) zero (ii) Maximum?
7) On the basis of KMT of gases, show that ½ $m\overline{v^2}$ = 3/2 KT
8) Derive the relation between the Electric field Intensity and Electric potential.
9) Define motional E.M.F and derive the relevant formula.
10) How can a Galvanometer can be converted into Voltmeter?. Derive the relevant expression.

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