Roll No. : _____

Objective Paper Code **8474**

Intermediate Part Second - 103

PHYSICS (Objective) GROUP - II

Time: 20 Minutes Marks: 17

FBD-G2-22

Q.No.1 **You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill the relevant circle in front of that question number on computerized answer sheet. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero marks in that question. Attempt as many questions as given in objective type question paper and leave other circles blank.coa**

S.#	Questions	A	B	C	D
1	The energy released by fusion of two deuterons into a helium nucleus is about:	24 MeV	200 MeV	1.02 MeV	7.2 MeV
2	One Joule of energy absorbed in a body per kg is equal to:	1 rad	1 rem	Sievert	Gray
3	Paschan series is obtained when all the transitions of electron terminate on:	2nd orbit	3rd orbit	4th orbit	5th orbit
4	Platinum wire becomes yellow at room temperature of:	900°C	1300°C	1600°C	500°C,
5	If object moves with the speed of light, its mass become:	Zero	Small	Same	Infinity
6	The thickness of a base in a transistor is of the order of:	10^{-3}m	10^{-4}m	10^{-6}m	10^{2}m
7	$X = \overline{A \cdot B}$ is the mathematical notation for:	NAND gate	NOR gate	OR gate	AND gate
8	The critical temperature for mercury is:	7.2K	4.2K	1.18K	3.7K
9	Resistance of choke is:	Zero	Very small	Large	Infinite
10	In three phase, voltage across any two lines is:	220V	230V	400V	430V
11	In DC generator, split rings acts as:	Capacitor	Commutator	Inductor	Resistor
12	Energy stored in the inductor is:	$\frac{1}{2}L^2I$	$\frac{1}{2}LI$	$\frac{1}{2}LI^2$	$\frac{1}{2}L^2I^2$
13	A galvanometer becomes more sensitive when the factor $\frac{C}{BAN}$ will be:	Large	Small	Constant	Zero
14	Force on a moving charge in a uniform magnetic field will be maximum, when the angle between $\vec{V}$ and $\vec{B}$ is:	0°	30°	60°	90°
15	Kirchhoff's first rule is based on conservation of:	Energy	Voltage	Charge	Mass
16	Coulomb per volt is called:	Farad	Ampere	Joule	Ohm
17	If the distance between two point charges is halved. the electric force becomes:	Half	Double	¼ times	4 times

Intermediate Part Second Roll No. _____

PHYSICS (Subjective) GROUP - II

Time: 02:40 Hours Marks: 68 FBD-92-22

SECTION – I

2. **Write short answers to any EIGHT parts.** 16

(i) Is E necessarily zero inside a charged rubber balloon if balloon is spherical? Assume that charge is distributed uniformly over the surface.

(ii) Describe the force or forces on a positive point charge when placed between parallel plates (a) with similar and equal charges (b) with opposite and equal charges.

(iii) Derive relation for potential gradient $E = -\frac{\Delta V}{\Delta r}$

(iv) Write similarities and differences between electrostatic and gravitational forces.

(v) Define CRO and write the names of its parts.

(vi) Define tesla and write its formula.

(vii) Why does the picture on a TV screen become distorted when a magnet is brought near the screen?

(viii) What should be the orientation of a current carrying coil in a magnetic field so that the torque acting upon the coil is (a) maximum (b) minimum ?

(ix) What do you understand by "back ground radiation"? State two sources of this radiation.

(x) What do you mean by the term critical mass?

(xi) Define absorbed dose and gray.

(xii) Write the names of basic forces of nature.

3. **Write short answers to any EIGHT parts.** 16

(i) Is the filament resistance lower or higher in a 500W, 220V light bulb than in a 100W, 220V bulb?

(ii) Why does the resistance of conductor rise with temperature?

(iii) State Kirchhoff's second rule and write its mathematical formula.

(iv) Write any two properties of parallel resonance circuit.

(v) How does doubling the frequency affect the reactance (a) an inductor (b) a capacitor?

(vi) How the reception of a particular radio station is selected on your radio set?

(vii) Define modulus of elasticity. Show that units of modulus of elasticity and stress are the same.

(viii) What is meant by strain energy?

(ix) Distinguish between crystalline solids and amorphous solids.

(x) Why is the base current in a transistor very small?

(xi) Why charge carriers are not present in the depletion region?

(xii) Write the names of three parts of a transistor.

4. **Write short answers to any SIX parts.** 12

(i) Does the induced emf in a circuit depend on the resistance of the circuit? Does the induced current depend on the resistance of the circuit?

(ii) Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?

(iii) What factors can change the mutual inductance of two coils?

(iv) If the length of solenoid is doubled keeping all other factors same, what will be change in energy density of current carrying solenoid?

(v) Why do not we observe a Compton's effect with visible light?

(vi) Will higher frequency light eject greater number of electrons than low frequency light?

(vii) Explain NAVSTAR navigation system.

(viii) Can the electron in the ground state of hydrogen absorb a photon of energy 13.6eV and greater than 13.6eV?

(ix) Explain bremsstrahlung in x-rays spectrum.

SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) State Gauss's law and apply it to find out the electric intensity due to infinite sheet of charge. 05

(b) A rectangular bar of iron is 2cm by 2cm in cross-section and 40cm long. Calculate its resistance. 03

(Resistivity = $11\times10^{-8}\Omega m$)

6. (a) State Ampere's law and apply it to find the magnetic field due to a current carrying solenoid. 05

(b) When current through a coil changes from 100mA to 200mA in 0.005s, an induced emf of 40mV is produced in the coil. What is the self-inductance of the coil? 03

(Continued P/2)

. (a) What is transistor? Describe its construction and operation. Also show that how current flows in n p n transistor? 05

(b) Find the value of current flowing through a capacitance 0.5μF, when connected to a source of 150V at 50Hz. 03

. (a) What are intrinsic and extrinsic semi-conductors? How the p-type and n-type materials are formed? 05

(b) X-rays of wavelength 22pm are scattered from a carbon target. The scattered radiation being viewed at 85° to the incident beam. What is Compton shift? 03

. (a) Describe atomic spectrum of hydrogen. Show that energy of electron in hydrogen atom is quantized. 05

(b) Calculate the energy (in MeV) released in the following fusion reaction: 03

$$^{2}_{1}H + {}^{3}_{1}H \rightarrow {}^{4}_{2}He + {}^{1}_{0}n .$$