Roll No. : _____

Objective Paper Code **8471**

Intermediate Part Second (New Scheme)

PHYSICS (Objective) GROUP - I

Time: 20 Minutes Marks: 17

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.**

S.#	Questions	A	B	C	D
1	The force on an electron in a field of $1\times10^{8}\,NC^{-1}$ will be:	1.6×10^{-8}N	1.6×10^{-11}N	1.6×10^{-19}N	1.6×10^{-27}N
2	Electric flux is maximum, when angle between $\vec{E}$ and surface area is:	0°	90°	180°	45°
3	Heat generated by a 50 watt bulb in one hour is:	36000 J	48000 J	18000 J	180000 J
4	The relation $B=\frac{\mu_0 I}{2\pi r}$ is called:	Ampere's law	Faraday's law	Lenz's law	Gauss's law
5	The magnetic force on an electron, travelling at $10^{6}ms^{-1}$ parallel to the magnetic field of strength 1T is:	10^{-12}N	10^{3}N	0	16×10^{-12}N
6	One of the applications of mutual induction is:	Choke	Rectifier	Rheostat	Step up transfer
7	Henry can be written as:	VsA^{-1}	$V^{-1}A^{-1}$	$Vs^{-1}A$	$V^{-1}sA$
8	In RLC series resonance circuit, at resonance frequency, impedance Z is:	$\sqrt{R^2+X_L^2}$	R	$\sqrt{R^2+X_C^2}$	X_L
9	Choke consumes extremely small:	Current	Charge	Power	Potential
10	A single domain in paramagnetic substance contains nearly:	$10^{8}-10^{10}$ atoms	$10^{15}-10^{20}$ atoms	$10^{12}-10^{20}$ atoms	$10^{12}-10^{16}$ atoms
11	$X=\overline{A\cdot B}$ is the mathematical notation for:	NAND gate	OR gate	NOR gate	AND gate
12	In a comparator circuit, when intensity of light decreases, then resistance of LDR:	R_L increases	R_L decreases	V_R decreases	V_{in} increases
13	If an electron is accelerated through a potential difference of 10 V, then energy gained by electron is:	1.6×10^{-20}J	1.6 eV	10 eV	1.6×10^{-19}eV
14	If velocity of a body becomes equal to "C", then its mass becomes:	0 kg	$m=m_0$	$m\to\infty$	$m=\frac{m_0}{2}$
15	An electron can reside in the meta stable state for about:	10^{3}s	10^{-8}s	10^{8}s	10^{-3}s
16	Half life of iodine-131 is 8 days and it weighs 20mg. After 4 half lives, the amount left behind will be:	2.5mg	1.25mg	0.625mg	0.312mg
17	Which group belongs to Hadrons?	Protons and neutrons	Mesons and neutrinos	Photons and electrons	Positrons and electrons

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Intermediate Part Second (New Scheme)

PHYSICS (Subjective) GROUP - I FBD-12-G1-19

Time: 02:40 Hours Marks: 68

SECTION – I

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

(i) Define potential gradient and show that $E = -\frac{\Delta V}{\Delta r}$

(ii) Write two differences between electrical and gravitational forces.

(iii) How can you identify that which plate of a capacitor is positively charged?

(iv) Suppose that you follow an electric field line due to positive point charge. Do electric field and the potential increase or decrease?

(v) What do you know about sensitivity of galvanometer?

(vi) What are the uses of CRO ?

(vii) How can you use a magnetic field to separate isotopes of chemical element?

(viii) Why the resistance of an ammeter should be very low?

(ix) What are the factors upon which the mutual inductance depends?

(x) What is the back motor effect in generators?

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

(xii) Show that ε and $\frac{\Delta\phi}{\Delta t}$ have the same units.

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

(i) State the Kirchhoff's first and second rule.

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

(iii) What is meant by the tolerance in a resistor? Write the value of tolerance of silver and gold.

(iv) What is a choke?

(v) What is meant by AM and FM ?

(vi) A circuit contains an iron cored inductor, a switch and ... three arranged in series. The switch is closed and after an interval reopened. Explain why a spark ju... the switch contacts? ... examples.

(vii) Define diamagnetic and ferromagnetic substa...

(viii) Distinguish between crystalline and amorp...

(ix) What is the mechanism of electrical c... ...es and electrons in a pure semiconductor element?

(x) Why ordinary silicon diodes do no... ...ction regions?

(xi) Why charge carriers are not pres...

(xii) What is solar cell? Give its uses.

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

(i) What advantages an electron microscope has over an optical microscope?

(ii) When does light behave as a wave? When does it behave like a particle?

(iii) Calculate the value of Compton wave length of electron.

(iv) Explain why laser action could not occur without population inversion between atomic levels?

(v) How K_α and K_β X-rays are emitted?

(vi) How can radioactivity help in the treatment of Cancer?

(vii) What do you understand by background radiations? State two sources.

(viii) Differentiate between Hadrons and Leptons.

(ix) Write any two uses of radiography.

SECTION – II

Attempt any THREE questions. Each question carries 08 marks.

5. (a) What is capacitor? Derive a relation for the capacitance of parallel plate capacitor. Show that capacitance varies in the presence of dielectric between the plates of capacitor. 05

(b) The resistance of an iron wire at 0°C is $1\times10^{4}\Omega$. What is the resistance at 500°C if the temperature coefficient of resistance of iron is $5.2\times10^{-3}K^{-1}$? 03

6. (a) Explain the phenomena of mutual induction, mutual inductance and define its units. 05

(b) Alpha particles ranging in speed from $1000ms^{-1}$ to $2000ms^{-1}$ enter into a velocity selector where the electric intensity is $300Vm^{-1}$ and the magnetic induction 0.20T. Which particle will move undeviated through the field? 03

7. (a) What is transistor? How it is used as an amplifier? Derive its voltage gain equation. 05

(b) At what frequency will an inductor of 1.0H have a reactance of 500Ω ? 03

8. (a) Describe de-Broglie's hypothesis and explain Davisson and Germer experiment to confirm this hypothesis. 02,03

(b) What stress would cause a wire to increase in length by 0.01% if the Young's modulus of the wire is $12\times10^{10}Pa$. What force would produce this stress if the diameter of the wire is 0.56 mm? 03

9. (a) What is radioactivity? Discuss emission of alpha (α), beta (β) and gamma (γ) radiations from radioactive nuclei. 05

(b) Compute the shortest wavelength radiation in the Balmer series. What value of "n" must be used? 03

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