

Objective
Paper Code
8472

Intermediate Part Second
PHYSICS (Objective) GROUP - II
Time: 20 Minutes

Roll No. : _____



Marks: 17

FSD-2-24

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	A particle carrying a charge of $2e$ falls through a potential difference of $10V$. The energy acquired by it is:	$2eV$	$5eV$	$10eV$	$20eV$
2	In a capacitor energy is stored in:	Electric field	Magnetic field	Gravitational field	Nuclear field
3	The charge carriers in electrolyte are:	Free electrons	Positive and negative ions	Free electrons and ions	Electrons and holes
4	Output waveform of sweep or time base generator is:	Saw tooth wave	Sinusoidal wave	Square wave	Digital wave
5	An alpha particle of charge $2e$ enters a uniform magnetic field of $0.1T$ with velocity $10ms^{-1}$ perpendicularly, the magnetic force acting on it will be:	$1.6 \times 10^{-19}N$	$3.2 \times 10^{-19}N$	$6.4 \times 10^{-19}N$	Zero
6	Lenz's law is in accordance with the law of conservation of:	Charge	Mass	Momentum	Energy
7	Eddy currents are setup in a direction:	Parallel to flux	Antiparallel to flux	Perpendicular to flux	At an angle 45° to the flux
8	The unit of impedance is:	Ohm	Farad	Volt	$(Ohm)^{-1}$
9	The power factor in a series resonance circuit at resonance is:	0	1	-1	Infinity
10	The units of modulus of elasticity are the same as those of:	Stress	Strain	Power	Work done
11	In case of non-inverting operational amplifier, if $R_1 = \frac{R_2}{2}$, then:	$V_{out} = 2 V_{in}$	$V_{in} = 2 V_{out}$	$V_{out} = 3 V_{in}$	$V_{in} = 3 V_{out}$
12	$X = A \cdot \bar{B} + \bar{A} \cdot B$ is the mathematical mutation for:	NOR gate	NAND gate	XOR gate	XNOR gate
13	The slope of the maximum K.E of photoelectrons versus light frequency graph represents	Momentum	Planck's constant	Maximum wavelength	Work function
14	The minimum energy required for pair production is:	$0.51 MeV$	$1.51 MeV$	$1.02 MeV$	$0.051 MeV$
15	The radius of second Bohr radius for hydrogen atom is:	$0.053 nm$	$0.212 nm$	$0.106 nm$	$0.848 nm$
16	The dead time for G.M counter is:	$10^{-3}s$	$10^{-4}s$	$10^{-5}s$	$10^{-8}s$
17	Unit of radioactivity is curie (Ci). Which is equal to _____ disintegration per second.	3.74×10^9	3.7×10^{10}	3.64×10^9	4.5×10^9

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PHYSICS (Subjective) GROUP - II

Time: 02:40 Hours

Marks: 68

FSD-2-24

SECTION – I**2. Write short answers to any EIGHT parts.**

16

- (i) Define dielectric coefficient of capacitance.
- (ii) Show that $\text{Ohm} \times \text{Farad} = \text{Second}$.
- (iii) Electric lines of force never cross. Why?
- (iv) In the presence of dielectric why potential difference decreases?
- (v) Why does the picture on a T.V screen becomes distorted when a magnet is brought near the screen?
- (vi) What is Lorentz force? Give the role of electric and magnetic force in this regard.
- (vii) Do two long and parallel current carrying wires attract each other? Explain.
- (viii) A power line 20m high carries a current 200 A. Find the magnetic field of the wire at the ground.
- (ix) If decay constant of a radioactive isotope is 0.3465 hr^{-1} . What will be its half-life?
- (x) What is nuclear transmutation? Give one example.
- (xi) What is radiography? Write its one use.
- (xii) Discuss the advantages and disadvantages of nuclear power compared to the use of fossil fuel generated power.

3. Write short answers to any EIGHT parts.

16

- (i) Write names of two devices in which resistance decreases due to increase in temperature.
- (ii) Do bends in a wire affect its electrical resistance? Explain.
- (iii) What are the difficulties in testing whether the filament of a lighted bulb obeys Ohm's law?
- (iv) In RLC series circuit, the impedance of the circuit at resonance is resistive. Why?
- (v) A sinusoidal current has rms value of 10A. What is the maximum or peak value?
- (vi) Name the device that will (a) permit flow of direct current but oppose the flow of alternating current (b) permit flow of alternating current but not the direct current.
- (vii) Differentiate between glossy solids and polymeric solids.
- (viii) Define modulus of elasticity. Show that the units of modulus of elasticity and stress are the same.
- (ix) What is meant by strain energy?
- (x) Summarize the advantages of photo diode.
- (xi) What is net charge on a n-type or a p-type substance?
- (xii) Why charge carriers are not present in the depletion region?

4. Write short answers to any SIX parts.

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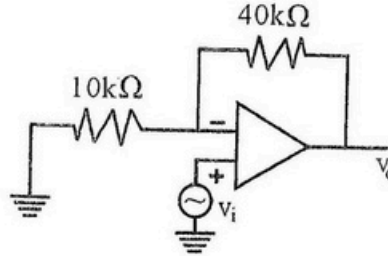
- (i) Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?
- (ii) How would you position a flat loop of wire in a changing magnetic field so that there is no emf induced in the loop?
- (iii) Define motional emf. Write its expression.
- (iv) What happens to total radiation from a black body if its absolute temperature is doubled?
- (v) Is it possible to create a single electron from energy? Explain.
- (vi) State the two postulates of special theory of relativity.
- (vii) What is work function? Write its mathematical relation with threshold frequency.
- (viii) Mention any four applications of LASER.
- (ix) Can X-rays be reflected, refracted, diffracted and polarized just like any other waves? Explain.

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

5. (a) Define absolute potential. Derive its relation due to a point charge at a distance r from it. 05
- (b) A charge of 90C passes through a wire in 1 hour and 15 minutes. What is the current in the wire? 03

(Continued P/2)

6. (a) Discuss the principle, construction and working of an alternating current generator. Also find expression for induced emf and induced current. 05
(b) What current should pass through a solenoid that is 0.5m long with 10000 turns of copper wire, so that it will have a magnetic field of 0.4T? 03
7. (a) Describe the flow of $A \cdot C$ through resistor and through capacitor. 05
(b) Calculate the gain of non-inverting amplifier as shown in figure given below: 03



8. (a) What is photoelectric effect? Explain it on the basis of quantum theory. 05
(b) A 1.25cm diameter cylinder is subjected to a load of 2500kg. Calculate the stress on the bar in mega pascals. 03
9. (a) What is meant by half-life of a radioactive element? How it can be determined by the decay of radioactive element? 05
(b) Compute the shortest wavelength radiation in the Balmer series. What value of n must be used? 03

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