

PHYSICS — OBJECTIVE

Intermediate Part-II · 1st Annual 2025 — Group: II

Time: 20 Minutes	OBJECTIVE	Marks: 17
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NOTE: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of the relevant question number. Use marker or pen to fill in the circles. Cutting or filling of two or more circles will result zero mark in that question.

QUESTION NO. 1

1	Conversion of A.C into D.C is called (A) Modulation (B) Oscillation (C) Amplification (D) Rectification
2	Lenz's Law is in accordance with the Law of Conservation of (A) Mass (B) Momentum (C) Charge (D) Energy
3	Neutron was discovered in 1932 by (A) Bohr (B) Chadwick (C) Dirac (D) Fermi
4	The concept of electric field was given by (A) Faraday (B) Henry (C) Michelson (D) Orested
5	Tesla is a unit of (A) Flux density (B) Magnetic flux (C) Self-inductance (D) Mutual inductance
6	One amu is equal to (A) 931 Mev (B) 9.31 Mev (C) 93.1 Mev (D) 0.931 Mev
7	In case of capacitor, the unit of reactance is (A) Ohm (B) mho (C) Farad (D) Henry
8	The self-inductance is given by (A) $NL = \phi I$ (B) $NI = L\phi$ (C) $N\phi = LI$ (D) $N = LI$
9	The number of electrons in one coulomb charge is equal to (A) 1.6×10^{-19} electron (B) 6.25×10^{-19} electron (C) 6.25×10^{15} electron (D) 6.25×10^{19} electron
10	The rest mass of Photon is (A) Infinite (B) 1.6×10^{-27} kg (C) Zero (D) 3×10^8 kg
11	The units of Rydberg's constant is (A) ms^{-1} (B) m (C) Nm^{-2} (D) m^{-1}
12	Capacitive reactance $X_C = \frac{1}{\omega C}$ (A) $2\pi fC$ (B) $\frac{1}{2\pi fC}$ (C) $4\pi fC$ (D) $\frac{1}{4\pi fC}$
13	Albert Einstein was awarded Nobel Prize in (A) 1918 (B) 1921 (C) 1905 (D) 1911
14	For rectification, we use (A) Transformer (B) Diode (C) Choke (D) Generator
15	If the number of turns becomes double but length remains same, the magnetic field in the solenoid becomes (A) Half (B) Double (C) Same (D) Zero
16	Charge carrier in electrolytes are (A) Proton (B) Electron (C) Holes (D) Positive and Negative ions
17	Which is crystalline solid? (A) Zirconia (B) Glassy Solid (C) Natural Rubber (D) Polystyrene

PHYSICS — SUBJECTIVE

Intermediate Part-II · 1st Annual 2025 — Group: II

Time: 2.40 Hours	SUBJECTIVE	Marks: 68
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SECTION - I

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

QUESTION NO. 2 Write short answers to any EIGHT (8) questions:

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i	How can you identify that which plate of a capacitor is positively charged?
ii	Is $\vec{E}$ necessarily zero inside a charged rubber balloon if balloon is spherical? Assume that charge is distributed uniformly over the surface.
iii	Why circuits of sensitive electronic devices such as T.V and computers are often enclosed within metal boxes?
iv	Define electron volt. Also write its value.
v	Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate? Explain.
vi	What should be the orientation of a current carrying coil in a magnetic field so that torque acting upon the coil is (a) Maximum (b) Minimum?
vii	Explain Right Hand Rule to find the direction of magnetic field around a current carrying conductor.
viii	Define ammeter. How galvanometer is converted into an ammeter?
ix	What do we mean by the term critical mass?
x	A particle which produces more ionization is less penetrating. Why?
xi	What are the biological effects of low level radiation and high levels of radiation.
xii	Define mass defect and binding energy.

QUESTION NO. 3 Write short answers to any EIGHT (8) questions:

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i	Describe a circuit which will give a continuously varying potential.
ii	Why does the resistance of a conductor rise with temperature?
iii	What is thermistor? How it can be used to measure low temperature, especially at near 10K?
iv	Write down the name of 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
v	Explain the conditions under which electromagnetic waves are produced from a source.
vi	Write down two merits of frequency modulation.
vii	Distinguish between intrinsic and extrinsic semi-conductor.
viii	Why magnetic materials are not ferromagnetic above Curie temperature?
ix	What is the role of domains in magnetizing the material to saturation?
x	What is the net charge on a n-type or a p-type substance?
xi	Why ordinary silicon diodes do not emit light?
xii	If the potential difference between two inputs of inverting amplifier with open loop gain of 10^5 is 1mv. What will be output voltage?

QUESTION NO. 4 Write short answers to any SIX (6) questions:

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i	Define motional emf and write its relation.
ii	When an electric motor, such as an electric drill is being used, does it also act as a generator? If so what is the consequence of this?
iii	Can a D.C motor be turned into a D.C generator? What changes are required to be done?
iv	State Stefan-Boltzmann law and write its relation.
v	What is the energy of a photon in a beam of infrared radiation of wavelength 1240nm?
vi	If an electron and a proton have the same de-Broglie wavelength, which particle has greater speed?
vii	We do not notice the de-Broglie wavelength for a pitched cricket ball. Explain why?
viii	What is meant by population inversion?
ix	What do we mean when we say that the atom is excited?

SECTION - II

Q.5 (a)	State and explain Kirchhoff's Second Rule.	5
(b)	Two point charges, $q_1 = -1.0 \times 10^{-6}$ C and $q_2 = +4.0 \times 10^{-6}$ C are separated by a distance of 3.0m. Find and justify the zero-field location.	3
Q.6 (a)	State and prove Faraday's Law of electromagnetic induction.	5
(b)	What current should pass through a solenoid that is 0.5m long with 10,000 turns of copper wire so that it will have a magnetic field of 0.4T?	3
Q.7 (a)	What is rectification? Explain full wave rectification. How pulsating output voltage is made smooth?	5
(b)	A circuit has an inductance of $\frac{1}{\pi}$ H and resistance of 2000 Ω . A 50Hz A.C is supplied to it. Calculate the reactance and impedance offered by the circuit.	3
Q.8 (a)	Explain Strain Energy in deformed material. Use graphical method to determine work done by force.	5
(b)	What is the energy of a photon in a beam of infrared radiation of wavelength 1240nm?	3
Q.9 (a)	In case of Hydrogen Atom, derive the relations for its (i) Quantized Radii (ii) Quantized Energies	5
(b)	The half-life of ${}_{38}\text{Sr}^{91}$ is 9.70 hours. Find its decay constant.	3

the source. • Board typos are kept as printed (“Defne ammeter”, “masa defect”, “uniformly ever the surface”, “Stefen-Boltzmann”, “Orested”). • Subjective Q4(v) and Section-II Q8(b) are the same question on the source paper; both are reproduced as printed. • Typeset by Tayarri from the original board paper; no answer key included.