Gujranwala Board Group-I *(First Annual Examination 2025)*

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 that question number. Use marker or pen to fill the circle, Cutting or filling two or more circles will result in zero mark in that question.

Q1.

Sr.	Questions	A	B	C	D
1	K_β X-rays are produced due to transition of electron	K to L shell	L to K shell	M to K shell	M to L shell
2	When a charge particle is projected parallel to a uniform magnetic field, its path or trajectory will be	Straight line	Circular	Helical	Elliptical
3	A solid having regular arrangement of atoms or molecules is called	Crystalline solid	Amorphous solid	Polymeric solid	Glassy solid
4	A photodiode can turn its current ON and OFF in	Milliseconds	microseconds	nanoseconds	picoseconds
5	$X = A.\overline{B}+\overline{A}.B$ is the mathematical notation for	NOR gate	NAND gate	XOR gate	XNOR gate
6	The decayed fraction of a radioactive element after two half lives is	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{7}{8}$
7	The effective way to increase the sensitivity of a galvanometer is to	Increase the number of turns	Increase the magnetic field strength	Increase the area of coil	Decrease the area of coil
8	The wavelength associated with an electron moving with a speed of 1.0×10^6 ms^{-1} is	7.3×10^{-10}m	7.3×10^{-11}m	6.5×10^{-10}m	6.5×10^{-11}m
9	The electrical potential at the mid point in an electric dipole is	0 V	0.5 V	1.0 V	1.5 V
10	The slope of q-t curve at any instant of time when A.C passes through a capacitor represents	Voltage	Inductance	Impedance	Current
11	The impedance of series resonance circuit at resonance is	Zero	Resistive	Capacitive	Inductive
12	When the platinum wire is heated, it becomes white at about	900°C	1100°C	1300°C	1600°C
13	The binding energy per nucleon is maximum for	Uranium	Helium	Barium	Iron
14	The working principle of alternating current generator is	Coulomb's law	Faraday's law	Lenz's law	Ampere's law
15	Kirchhoff's 1st rule is the manifestation of law of conservation of	Mass	Momentum	Charge	Energy
16	Selenium is a	Conductor	Insulator	Semiconductor	Photoconductor
17	When the motor is just started, the back emf is	Maximum	Minimum	Almost zero	Equal to current

PHYSICS	(Intermediate Part-II, Class 12th (1st A425)	Paper II	(Group-I)
Time : 20 Minutes	SUBJECTIVE	Marks: 68	

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

SECTION - I

Q2. **Write short answers to any EIGHT questions:** (2×8=16)

(i) The potential is constant throughout a given region of space. Is electric field zero or non-zero in this region?

(ii) Do electrons tend to go to the region of high potential or low potential?

(iii) Define capacitance with units. (iv) Define the relative permittivity ϵ_r.

(v) If a charge particle moves in a straight line through some region of space is magnetic field zero there?

(vi) Why does the picture of a T.V. screen becomes distorted, when a magnet is brought near the screen?

(vii) Why a voltmeter is used in parallel? (viii) Define sensitivity of a galvanometer.

(ix) Why heavy nuclei are unstable?

(x) A particle which produces more ionization is less penetrating why?

(xi) Write down the names of six quarks with charge.

(xii) What do you mean by equivalent doze (De)? Explain.

Q3. **Write short answers to any EIGHT questions:** (2×8=16)

(i) Do bends in a wire affect its electrical resistance? Explain.

(ii) What are the difficulties in testing whether the filament of a lighted bulb obeys Ohm's Law?

(iii) What is meant by A.M and F.M?

(iv) In a R-L circuit, will the current Lag or Lead the voltage? Illustrate your answer by a vector diagram.

(v) Distinguish between amorphous and polymeric solids.

(vi) Differentiate between tensile and shear modes of stress and strain.

(vii) Why ordinary silicone diodes do not emit light?

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

(ix) Write down the truth table of XNOR gate. (x) Write down uses of superconductors. (only three)

(xi) What is choke? Write down its uses. (xii) What is meant by "Tolerance"? Give example.

Q4. **Write short answers to any SIX questions:** (2×6=12)

(i) A square loop of wire is moving through a uniform magnetic field. The normal to the loop is oriented parallel to the magnetic field. Is an emf induced in the loop? Write down a reason for your answer.

(ii) Does the induce emf always act to decrease the magnetic flux through a circuit?

(iii) State Faraday's law. Also write down its mathematical relation.

(iv) As a solid is heated and begins to glow. Why does it first appear red?

(v) Which has lower energy quanta? Radio waves or X-rays.

(vi) State position-Momentum Uncertainty Principle and give its mathematical form.

(vii) Write down the postulates of special theory of relativity.

(viii) Is energy conserved when we say that the atom is said to be excited?

(ix) Differentiate between K_α and K_β X-rays.

SECTION - II

Q5. (a) What is electric polarization? Explain how polarization affects the capacitance of parallel plate capacitor? 5

(b) How many electrons pass through an electric bulb in one minute if 300mA current is passing through it? 3

Q6. (a) State and explain Lenz's Law. 5

(b) Find the value of the magnetic-field that will cause a mximum force of 7.0×10^{-3}N on a 20.0cm straight wire carrying a current of 10.0A. 3

Q7. (a) Explain the flow of A.C through an inductor and discuss the phase relationship between current and voltage. 5

(b) The current flowing into the base of a transistor is 100 μA. Find its collector current I_c, its emitter current I_E and the ratio $\dfrac{I_c}{I_E}$ if the value of current gain β is 100. 3

Q8. (a) State the Broglie Hypothesis. How did Davisson and Germer prove it experimentally? 5

(b) A 1.25 cm diameter cylinder is subjected to a load of 2500 kg. Calculate the stress on the bar in mega pascals. 3

Q9. (a) What is Nuclear Reactor? Describe the function of its main parts. 5

(b) Calculate the longest wavelength of radiation for the Paschen Series. 3