Lahore Board Group-II *(First Annual Examination 2025)*

NOTE: Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answers book. Cutting or filling two or more circles will result in zero mark in that question.

Q1.

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1	**Above curie temperature, iron becomes:**			
	(A) Ferromagnetic	(B) Diamagnetic	(C) Insulator	(D) Paramagnetic
2	**Mutual induction has practical role in the working of:**			
	(A) Galvanometer	(B) Ammeter	(C) A.C. generator	(D) Transformer
3	**When a platinum wire is heated it becomes white at about:**			
	(A) 500 °C	(B) 1600 °C	(C) 2000 °C	(D) 2500 °C
4	**Electric field and electric potential are related by the relation:**			
	(A) $E = \Delta V r$	(B) $E = -\dfrac{\Delta V}{\Delta r}$	(C) $E = K\dfrac{q}{r^2}$	(D) $E = -\dfrac{\Delta r}{\Delta V}$
5	**Which of the following has greater ionizing power:**			
	(A) α-rays	(B) β-rays	(C) γ-rays	(D) Neutrons
6	**Peak to peak value of A.C. is equal to:**			
	(A) V_0	(B) $2V_0$	(C) $\dfrac{V_0}{2}$	(D) V_0^2
7	**The range of ammeter can be increased if the value of shunt resistance is:**			
	(A) Decreased	(B) Increased	(C) Doubled	(D) Remains Constant
8	**Three capacitors each of capacitance $2\mu F$ are connected in parallel, their equivalent capacitance will be:**			
	(A) $2\mu F$	(B) $4\mu F$	(C) $6\mu F$	(D) $8\mu F$
9	**The width of depletion region of pn junction depends upon which factor:**			
	(A) Biasing condition	(B) Doping density	(C) Both A and B	(D) None of these
10	**X-rays can be deflected by**			
	(A) Electric field	(B) Magnetic field		
	(C) Both Electric and magnetic	(D) Cannot be deflected by fields		
11	**Which of the following does not vary by varying the frequency of A.C.:**			
	(A) Resistance	(B) Capacitive reactance	(C) Inductive reactance	(D) All of these
12	**Voltmeter is a device like:**			
	(A) High resistance galvanometer	(B) Low resistance galvanometer		
	(C) Ammeter	(D) Zero resistance galvanometer		
13	**After two half life, the fraction of the radioactive sample remain undecayed is:**			
	(A) N_0	(B) $\dfrac{N_0}{2}$	(C) $\dfrac{N_0}{4}$	(D) $\dfrac{N_0}{6}$
14	**Which of the following converts electrical energy into mechanical energy:**			
	(A) A.C. generator	(B) Heat engine	(C) Transformer	(D) Motor
15	**The SI unit for electric power is:**			
	(A) Horse power	(B) Watt	(C) KWh	(D) JS
16	**A diode characteristic curve is a graph between:**			
	(A) Current and time	(B) Voltage and time		
	(C) Voltage and current	(D) Current and resistance		
17	**The rest mass of photon is:**			
	(A) Zero	(B) m_0	(C) Infinite	(D) $9.1 \times 10^{-31} kg$

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: $(2\times8=16)$

(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: $(2\times8=16)$

(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: $(2\times6=12)$

(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