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

Physics   (A)   L.K.NO.1012   Paper Code No. 8472

Paper II (Objective Type)   1st - A -Exam 2025   Group 2nd

Time : 20 Minutes   Inter (PART - II)

Marks: 17   Session (2021 - 23) to (2023 - 2025)

Note: Four choices A, B, C, D to each question are given. Which choice is correct, fill that circle in front of that question number on the Objective Bubble Sheet. Use marker or pen to fill the circles. Cutting or filling two or more circle will result in zero mark in that question.

Q.No.1

(1) The Electric Force on an electron placed in an electric field of strength 1×10^8 NC^{-1} will be:

(A) 1.6×10^{-27} N   (B) 1.6×10^{27} N   (C) 1.6×10^{-11} N   (D) 1.6×10^{-19} N

(2) $\dfrac{\text{Second}}{\text{Farad}}$ Is equal to:

(A) Ohm   (B) Coulomb   (C) Joule   (D) Henry

(3) Heat generated by a 100 W bulb in one hour is:

(A) 3.6×10^5 J   (B) 3.6×10^6 J   (C) 3.6×10^4 J   (D) 1000 J

(4) Output waveform of the built-in voltage of CRO is (across x-plates):

(A) Sinusoidal   (B) Saw-tooth   (C) Square   (D) Linear

(5) Working principle of Galvanometer is similar to that of:

(A) DC Motor   (B) Transformer   (C) Generator   (D) Solar Cell

(6) 1 henry (H) = ?:

(A) 1 Ohm × 1 Farad   (B) 1 Ohm × 2 Second   (C) 1 Ohm × 1 Tesla   (D) 1 Tesla × 1 Second

(7) The emf induced in 1mH inductor in which current changes from 3A to 5A in 1s is:

(A) 2×10^{-3} V   (B) 2×10^{-4} V   (C) 2×10^{-6} V   (D) 2×10^{-8} V

(8) The Phase Difference between Voltage and Current in case of A.C. through a Resistor is:

(A) 90°   (B) 45°   (C) 60°   (D) 0°

(9) The Waves produced by Accelerating Electrical Charges are:

(A) Electromagnetic Waves   (B) Stationary Waves

(C) Longitudinal Waves   (D) Mechanical Waves

(10) Choose the Ductile Substance among the followings:

(A) Wrought Iron   (B) Glass   (C) High Carbon Steel   (D) Water

(11) The Resistance of a Reverse Biased P-N Junction is:

(A) Zero   (B) Sveral Mega Ochhms   (C) Very small   (D) Only a few Ohms

(12) In case of non-inverting OP-AMP, if $R_2 = 2R_1$ then:

(A) $V_{out} = 3 V_{in}$ (B) $V_{out} = 2 V_{in}$ (C) $V_{out} = V_{in}$ (D) $V_{out} = 4 V_{in}$

(13) The speed of X-Ray Photon in Vacuum is:

(A) Zero   (B) Infinite   (C) 2×10^6 ms^{-1} (D) 3×10^8 ms^{-1}

(14) Number of Gamma Ray Photons generated in the annihilation of Electron and Positron are:

(A) 1   (B) 2   (C) 3   (D) Zero

(15) The Radius of 3rd Bohr Orbit in Hydrogen Atom is (r1 = 0.053 nm):

(A) 0.159 nm   (B) 0.318 nm   (C) 0.018 nm   (D) 0.477 nm

(16) The SI unit of equivalent does is:

(A) Sievert   (B) Curie   (C) Red   (D) Gray

(17) Alpha particles are Nuclei of:

(A) Hydrogen   (B) Carbon   (C) Helium   (D) Uranium

Note: It is compulsory to attempt any (8-8) Parts each from Q.No.2, Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part-II. Write same Question No. and its Part No. as given in the Question Paper.

Make Diagram where necessary.   Part-I   22×2=44

Q.No.2

(i) Is $\vec{E}$ necessarily zero inside a Charged Rubber Balloon if balloon is Spherical? Assume that charge in distributed uniformly over the surface.

(ii) Suppose that you follow an Electric Field Line due to a positive point charge. Do Electric Field and the potential Increases or Decrease?

(iii) Prove that Electric Field is negative of the Potential Gradient.

(iv) State two similarities and two differences between Gravitational and Electric Forces.

(v) Why Concave Pole Pieces and Soft iron Cylinder are used to provide magnetic Field in a Galvanometer?

(vi) How a Galvanometer is converted to an Ohmmeter? How its scale is calibrated?

(vii) A charge 'q' of mass 'm' moves with Velocity 'v' in a uniform Magnetic Field. Why is there no work done by the Magnetic Force that acts on charge 'q'?

(viii) How can a current loop be used to detect the presence of Magnetic Field in a given region of space?

(ix) What do you understand by "Background Radiations"? State two sources of this Radiation.

(x) What do you mean by the Term Critical Mass?

(xi) How the strength of a Radiation Source is indicated? Give SI and Non-Si Unit related to this term.

(xii) What are the factors on which range of an Ionizing Radiation depend in a medium?

Q.No.3

(i) Describe a circuit which will give a continuously varying potential?

(ii) What is meant by an (emf) Electro Motive Force? Give its unit.

(iii) How can a Rheostat be used as Potential Divider?

(iv) How the reception of a particular Radio Station is selected on your Radio Set?

(v) An A.C Voltmeter reads 250V. What is its Peak Value?

(vi) Write three characteristics of Series Resonance Circuit.

(vii) What is meant by Strain Energy? How can it be determined from the force extension graph?

(viii) Discuss the Mechanism of Electrical Conduction by Holes and Electrons in pure semi conductor element?

(ix) What is Domains Regions which exists in Ferromagnetic Material?

(x) Why Charge Carriers are not present in the Depletion Region?

(xi) The inputs of a gate are '1' and '0'. Identify the gate if its output is: (a) '0' (b) '1'

(xii) Write down the Symbol and Truth Table of NOR Gate.

Q.No.4

(i) Does the Induced emf always act to decrease the magnetic Flux through a Circuit?

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

(iii) Is it possible to change both the Area of the Loop and the magnetic field passing through the loop and still not have an induced emf in the loop?

(iv) Will bright light eject more Electron from a metal surface than dimmer light of the same colour?

(v) Will higher Frequency Light eject greater number of Electrons than Low Frequency Light?

(vi) A Beam of Red Light and a Beam of Blue Light have exactly the same energy. Which beam contains the greater number of photon?

(vii) As a Solid is heated and begins to glow, why does it first appears red?

(viii) Is Energy conserved when an Atom emits a Photon of Light?

(ix) What do we mean when we say that the Atom is excited?

Part-II   3×8=24

Q.No.5 (a) Derive a relation for the Energy stored a Capacitor.   5

(b) A Platinum Wire has a resistance of 10 W at 0°C and 20 W at 273°C. Find the value of temperature coefficient of resistance of platinum.   3

Q.No.6 (a) Describe the method to find the e/m value of an Electron. Also Derive $\frac{e}{m} = \frac{2v}{B^2 r^2}$ 5

(b) A Square Coil of side 16cm has 200 turns and rotates in Uniform Magnetic Field of Magnitude 0.05 T. If the peak emf is 12 V, what is the Angular Velocity of Coil?   3

Q.No.7 (a) Define Rectification. Describe in detail the half Wave Rectification and Full Wave Rectification.   5

(b) Find the Value of the Current Flowing through a Capacitance 0.5 μF when connected to a source of 150 V at 50 Hz.   3

Q.No.8 (a) What is photoelectric Effect? Explain it on the Basis of Quantum Theory. Why it is not explained by Wave Theory?   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

Q.No.9 (a) Draw the Sketch of a Nuclear Power Station. Explain the working of four important parts of the Nuclear Reactor.   5

(b) Compute the Shortest Wavelength Radiation in the Balmer Series. What value of 'n' must be used?   3