

Group-I

SG

1219 Warning:- Please write your Roll No. in the space provided and sign.  
(Inter Part - II) (Session 2015-17 to 2017-19)

Roll No. \_\_\_\_\_  
Sig. of Student \_\_\_\_\_

Physics (Objective)

(Group I)

Paper (II)

PAPER CODE 4475

Maximum Marks:- 17

Time Allowed:- 20 minutes

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 circles. Cutting or filling two or more circles will result in zero mark in that question. Write PAPER CODE, which is printed on this question paper, on the both sides of the Answer Sheet and fill bubbles accordingly, otherwise the student will be responsible for the situation. Use of Ink Remover or white correcting fluid is not allowed.

Q. 1

- 1) Types of quarks are  
(A) 2 (B) 4 (C) 6 (D) 8
- 2) In liquid metal fast breeder reactor the type of uranium used is  
(A)  $^{235}_{92}\text{U}$  (B)  $^{238}_{92}\text{U}$  (C)  $^{234}_{92}\text{U}$  (D)  $^{239}_{92}\text{U}$
- 3) The force between two charges is 28 N. The paraffin wax of relative permittivity 2.8 is introduced between the charges as medium then force reduces to  
(A) 25 N (B) 20 N (C) 10 N (D) 15 N
- 4) A charge of  $10^{-10}\text{C}$  between two parallel plates 1 cm apart experience a force of  $10^{-5}\text{N}$ . The p.d. between the plates is  
(A) 10 V (B)  $10^2\text{V}$  (C)  $10^3\text{V}$  (D)  $10^4\text{V}$
- 5) Tolerance for silver colour is  
(A)  $\pm 10\%$  (B)  $\pm 15\%$  (C)  $\pm 20\%$  (D)  $\pm 5\%$
- 6) Two parallel wires carrying currents in opposite direction.  
(A) Repel each other (B) Attract each other (C) Neither attract nor repel (D) Stick to each other
- 7) A 5m wire carrying current 2 A at right angle to uniform magnetic field of 0.5 T. The force on the wire is  
(A) 1.5 N (B) 5 N (C) 2.5 N (D) 4 N
- 8) If the coil is wound on iron core, the flux through it  
(A) Decreases (B) Becomes zero (C) Remains constant (D) Increases
- 9) Energy stored per unit volume in magnetic field is called  
(A) Energy density (B) Electric flux (C) Work (D) Power
- 10) S.I unit of reactance is  
(A) Farad (B) Volt (C) Ampere (D) Ohm
- 11) The device which allows only the flow of D.C. is  
(A) Capacitor (B) Resistor (C) Inductor (D) Generator
- 12) A vacant or partially filled band is called  
(A) Fermi Band (B) Valence Band (C) Forbidden Band (D) Conduction Band
- 13) For normal operation of transistor, the Emitter-Base junction is always  
(A) Forward Biased (B) Reverse Biased (C) Unbiased (D) Grounded
- 14) The S.I unit of current gain is  
(A) Volt (B) Ampere (C) Coulomb (D) No unit
- 15) The factor  $\frac{h}{m_0 c}$  in Compton effect has the dimensions of  
(A) Pressure (B) Length (C) Mass (D) Momentum
- 16) The materialization of energy takes place in the process of  
(A) Photoelectric effect (B) Compton effect (C) Pair production (D) Annihilation of matter
- 17) Joule-Second is the unit of  
(A) Energy (B) Heat (C) Plank's constant (D) Power

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1219 Warning:- Please, do not write anything on this question paper except your Roll No.

Physics (Subjective) (Group I) (Session 2015-17 to 2017-19) (Inter Part - II) Paper (II)

Time Allowed: 2.40 hours Section ----- I

Maximum Marks: 68

2. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) Define Electrostatics and Xerography. (ii) Define Gaussian surface and Electric lines of force.
- (iii) The potential is constant through out a given region of space. Is the electric field is zero or non-zero in this region? Explain.
- (iv) How can you identify that which plate of a capacitor is positively charged?
- (v) Define magnetic induction and Tesla. (vi) Define Magnetic Flux and Flux Density.
- (vii) Why the resistance of an ammeter should be very low?
- (viii) Why the voltmeter should have a very high resistance.
- (ix) Define electromagnetic induction and Induced emf. (x) Define Mutual induction and Henry.
- (xi) Four unmarked wires emerge from a transformer. What steps would you take to determine the turns ratio?
- (xii) Can a D.C motor be turned into a D.C. generator? What changes are required to be done?

3. Answer briefly any Eight parts from the followings:-

8 × 2 = 16

- (i) What is wheatstone bridge? How can it be used to determine an unknown resistance?
- (ii) Is the filament resistance lower or higher in a 500 W, 220 V light bulb than in a 100 W, 220 V bulb?
- (iii) Define sources of current and give its two examples.
- (iv) Explain the conditions under which electromagnetic waves are produced from a source?
- (v) What is meant by A.M and F.M? (vi) What is choke? Explain. (vii) Explain the term Hysteresis.
- (viii) Define stress and strain. What are their SI units? (ix) What are superconductors? Write their types.
- (x) What is the biasing requirement of the junctions of a transistor for its normal operation? Explain how these requirements are met in a common emitter amplifier?
- (xi) The anode of a diode is 0.2 V positive with respect to its cathode. Is it forward biased?
- (xii) Write two characteristics of operational amplifier.

4. Answer briefly any Six parts from the followings:-

6 × 2 = 12

- (i) What advantages an electron microscope has over an optical microscope?
- (ii) Can pair production take place in vacuum? Explain.
- (iii) Find the energy of photon in radiowave of wavelength 100 m.
- (iv) Define excitation energy and ionization energy.
- (v) Can X-rays be reflected, refracted, diffracted and polarized just like any other waves? Explain.
- (vi) Explain briefly fission chain reaction. (vii) How can radioactivity help in the treatment of cancer.
- (viii) Define hadrons. Also differentiate between baryons and mesons.
- (ix) What information is revealed by the length and shape of the tracks of an incident particle in Wilson cloud chamber?

Note: Attempt any three questions.

Section ----- II

(8 × 3 = 24)

- 5. (a) What is electric potential? Find electric potential at a point due to a point charge.  
(b) A rectangular bar of iron is 2.0 cm by 2.0 cm in cross section and 40 cm long. Calculate its resistance if the resistivity of iron is  $11 \times 10^{-8} \Omega m$
- 6. (a) What is A.C Generator. Discuss the principle, construction and working of an A.C Generator. Also find expression for induced emf and current.  
(b) How fast must a proton move in a magnetic field of  $2.50 \times 10^{-3} T$  such that the magnetic force is equal to its weight?
- 7. (a) Describe R-L-C series circuit, derive the expression for its resonance frequency and write down its properties.  
(b) In a certain circuit, the transistor has a collector current of 10mA and a base current of  $40 \mu A$ . What is the gain of the transistor?
- 8. (a) What is Doping, Explain formation of n-type and p-type semiconductor.  
(b) An electron is placed in a box about the size of an atom that is about  $1.0 \times 10^{-10} m$ . What is the velocity of the electron.
- 9. (a) What is nuclear reactor? Describe its principle, construction and working.  
(b) The wavelength of K X-ray from copper is  $1.377 \times 10^{-10} m$ . What is the energy difference between the two levels from which this transition results?

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