

Time Allowed: 3 Hrs

Marks: 85

Note: There are **Three Sections** in this paper i.e. A, B and C. Attempt Section-A and return it to the Superintendent within the given time. No marks will be awarded for **Cutting, Erasing and Overwriting**.

Mobile Phone is strictly prohibited in Examination Hall.**Time: 20 Minutes****SECTION "A"****Marks: 18****Q.1.** Choose the correct option and shade one of (A, B, C, D) in the given **Bubble Answer Sheet**.

- i. The electric field is 50 N/C at a point due to a very long plane sheet of charge. If the distance of the point from the sheet is doubled, the electric field at that point will be:
 (A) 10N (B) 25N (C) 50N (D) 100N
- ii. If the number of electric field lines leaving a closed surface is less than those entering it, the surface must contain:
 (A) net positive charge (B) net negative charge (C) equal positive and negative charge (D) No charge
- iii. When a dielectric is inserted between the plates of a charged capacitor (with the battery disconnected), its capacitance:
 (A) increases (B) decreases (C) remains constant (D) becomes zero
- iv. The particular temperature at which the thermoelectric e.m.f becomes zero is called:
 (A) critical temperature (B) curie temperature (C) neutral temperature (D) inversion temperature
- v. A wire of length L has resistivity ρ . It is stretched to double its length. Its new resistivity will be:
 (A) $\rho/2$ (B) 2ρ (C) ρ (D) 4ρ
- vi. A charged particle enters a uniform magnetic field with its velocity perpendicular to the field. The trajectory of particle will be:
 (A) a straight line (B) a circle (C) a helix (D) an ellipse
- vii. A coil of 100 turns has a magnetic flux of 0.02 Wb through it. If the flux is reduced to zero in 0.1s, the magnitude of induced e.m.f is:
 (A) 0.2 V (B) 2 V (C) 20 V (D) 200 V
- viii. If the peak values of voltage and current in a purely resistive A.C circuit are 50V and 2A respectively, the average power dissipated in the resistor in one complete cycle is:
 (A) 25W (B) 50W (C) 75W (D) 100W
- ix. If the frequency of A.C source in a purely capacitive circuit is doubled, capacitive reactance in the circuit will:
 (A) be doubled (B) be halved (C) remain constant (D) be quadrupled
- x. If the length of a steel wire is doubled and its cross-sectional area is halved, its Young modulus will:
 (A) be halved (B) be doubled (C) remain constant (D) be quadrupled
- xi. The maximum stress a material can withstand under tension without breaking is called:
 (A) elastic limit (B) proportional limit (C) ultimate tensile strength (D) breaking stress
- xii. The materials which have filled valence band, empty conduction band and a smaller forbidden energy gap are:
 (A) insulators (B) semiconductors (C) conductors (D) superconductors
- xiii. The emitter is that part of a bipolar junction transistor which is:
 (A) large in size and heavily doped (B) moderate in size and heavily doped (C) small in size and heavily doped (D) small in size and lightly doped
- xiv. The Compton shift in wavelength for photons scattered at an angle of 90° with respect to the incident photons is:
 (A) h/mc (B) $2h/mc$ (C) $h/2mc$ (D) zero
- xv. In photoelectric effect, the number of photoelectrons emitted per sec from the surface of a metal is proportional to the:
 (A) frequency of light (B) work function of metal (C) wavelength of light (D) intensity of light
- xvi. The longest wavelength of emitted photons in the Lyman series of hydrogen spectrum, in terms of Rydberg constant R is:
 (A) $3R/2$ (B) $1/R$ (C) $4/3R$ (D) $3R/4$
- xvii. If E_0 is the ionization energy of hydrogen atom, the energy required to move an electron from ground state to the second excited state is:
 (A) $3E_0/4$ (B) $4E_0/3$ (C) $8E_0/9$ (D) $9E_0/8$
- xviii. The activity of a radioactive sample decreases to $(1/32)$ of its original value in 60 years. The half-life of the sample is:
 (A) 6 years (B) 9 years (C) 10 years (D) 12 years