

Instructions : 1) Check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
2) Use Blue or Black ink to write the underline and pencil to draw diagrams.

PART - I

- Note : i) Answer all the questions. ii) Choose and write the correct answer
1. The number of electric lines of force originating from a charge 1 nC is.....
a) 1.129×10^{11} b) 113 c) 1.129×10^8 d) 8.85×10^{-12} 30 x 1 = 30
2. Electric potential energy (U) of two point charges is..... a) $\frac{q_1 q_2}{4\pi\epsilon_0 r^2}$ b) $\frac{q_1 q_2}{4\pi\epsilon_0 r}$ c) $pE \cos\theta$ d) $pE \sin\theta$
3. A dipole is placed in a uniform electric field with its axis parallel to the field. It experiences
a) only a net force b) only a torque c) both a net force and torque d) neither a net force nor a torque
4. Four point charges $-Q$, $-q$, $2q$ and $2Q$ are placed, one at each corner of the square. The relation between Q and q for which the potential at the centre of the square is zero is a) $Q = -q$ b) $Q = -\frac{1}{q}$ c) $Q = q$ d) $Q = \frac{1}{q}$
5. The electric field outside the plates of two oppositely charged plane sheets of charge density σ is.....
a) $\sigma/2\epsilon_0$ b) $-\sigma/2\epsilon_0$ c) σ/ϵ_0 d) zero
6. The capacitance of a capacitor..... a) depends on charge b) depends on electric potential c) depends on both charge and electric potential d) depends on neither charge nor electric potential
7. If the length of a copper wire has a certain resistance R , then on doubling the length its specific resistance
a) will be doubled b) will become $\frac{1}{4}$ c) will become 4 times d) will remain the same
8. When n resistors of equal resistances (R) are connected in parallel the effective resistance is..... a) $\frac{n}{R}$ b) $\frac{R}{n}$ c) $\frac{1}{nR}$ d) nR
9. When two resistors R_1 , R_2 are connected in series, they consume 12W power. When they are connected in parallel, they consume 50W power. What is the ratio of power of individual resistors R_1 and R_2 a) $\frac{3}{2}$ b) $\frac{1}{2}$ c) $\frac{1}{4}$ d) 4
10. The slope of V-I characteristics of ohmic conductor is
a) Resistance b) Specific Resistance c) Conductance d) Temperature coefficient of Resistance
11. Nichrome wire is used as heating element because it has.....
a) low specific resistance b) low melting point c) high specific resistance d) high conductivity
12. The period of revolution of a charged particle inside a cyclotron does not depend on
a) the magnetic induction b) the charge of the particle c) the velocity of the particle d) the mass of the particle
13. The magnetic induction at the centre of a circular coil carrying current, if the current through the coil is doubled and the radius of the coil halved becomes a) halved b) unchanged c) doubled d) four times
14. In a thermocouple, the temperature of the cold junction is 20°C , the neutral temperature is 270°C then the inversion temperature is a) 520°C b) 540°C c) 500°C d) 510°C
15. The Self-inductance of a straight conductor is a) zero b) infinity c) very large d) very small
16. Which of the following cannot be stepped up in a transformer?
a) input current b) input voltage c) input power d) all
17. The power factor of RLC series circuit in resonance is a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 1 d) 0
18. An a.c. voltage is applied to a resistance R and an inductor L in series. If R and the inductive reactance are both equal to 3Ω , the phase difference between the applied voltage and the current in the circuit is..... a) $\frac{\pi}{6}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{2}$ d) zero
19. The unit henry can also be written as a) VsA^{-1} b) WbA c) Ωs^{-1} d) all
20. Atomic spectrum should be
a) pure line spectrum b) emission band spectrum c) absorption line spectrum d) absorption band spectrum
21. When a drop of water is introduced between the glass plate and plano convex lens in Newton's rings system, the ring system.....
a) contracts b) expands c) remains same d) first expands then contracts
22. A light of wavelength 6000\AA is incident normally on a grating 0.005 m wide with 2500 lines. Then the maximum order is.....
a) 3 b) 2 c) 1 d) 4
23. If the wave length of the light is increased four times, then the amount of scattering is
a) increased by 16 times b) decreased by 16 times c) increased by 256 times d) decreased by 256 times
24. In young's double slit experiment 12 fringes are obtained in a certain fragment of the screen, when light of wavelength of light 600 nm is used. If the wavelength of light is changed to 400 nm , the number of fringes observed in the same segment of the screen is..... a) 12 b) 18 c) 24 d) 30
25. Velocity of electromagnetic waves through vacuum is a) $\sqrt{\mu\epsilon}$ b) $\frac{1}{\sqrt{\mu_0\epsilon_0}}$ c) $\sqrt{\frac{\mu}{\epsilon}}$ d) $\sqrt{\frac{\epsilon}{\mu}}$
26. According to Bohr's postulates, which of the following quantities take discrete values?