

## PHYSICS

- Three small identical balls have charges  $-3 \times 10^{-12} \text{ C}$ ,  $8 \times 10^{-12} \text{ C}$  and  $4 \times 10^{-12} \text{ C}$  respectively. They are brought in contact and then separated. Calculate the charge on each ball.
  - $3 \times 10^{-12} \text{ C}$
  - $0.3 \times 10^{-12} \text{ C}$
  - $30 \times 10^{-12} \text{ C}$
  - $0.03 \times 10^{-12} \text{ C}$
- A dipole is placed in a uniform electric field with its axis parallel to the field. It experiences
  - Only a net force
  - Only a torque
  - Both a net force and torque
  - Neither a net force nor a torque
- A charge of 60 C passes through an electric lamp in 2 minutes. Then the current in lamp is
  - 30 A
  - 1 A
  - 0.5 A
  - 5 A
- Peltier coefficient at a junction of a thermocouple depends on
  - The current in the thermocouple
  - The time for which current flows
  - The temperature of the junction
  - The charge that passes through the thermocouple
- A coil of area of cross section  $0.5 \text{ m}^2$  with 10 turns is in a plane which is perpendicular to an uniform magnetic field of  $0.2 \text{ Wb m}^{-2}$ . The flux through the coil is
  - 100 Wb
  - 10 Wb
  - 1 Wb
  - Zero
- The self inductance of a straight conductor is
  - Zero
  - Infinity

- (c) Very large  
(d) Very small
7. If the wavelength of the light is reduced to one fourth, 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
8. The first excitation potential energy or the minimum energy required to excite the atom from ground state of hydrogen atom is
- (a) 13.6 eV  
(b) 10.2 eV  
(c) 3.4 eV  
(d) 1.89 eV
9. X-ray is
- (a) Phenomenon of conversion of kinetic energy into radiation  
(b) Conversion of momentum  
(c) Conversion of energy into mass  
(d) Principle of conservation of charge
10. Calculate the de Broglie wave length of an electron of kinetic energy 120 eV.
- (a) 11.21 Å  
(b) 1.121 Å  
(c) 112.1 Å  
(d) 1121 Å
11. The nuclear radius of  ${}^8_4\text{Be}$  nucleus is
- (a) 1.3 fm  
(b) 2.6 fm  
(c) 13 pm  
(d) 26 pm
12. The explosion of atom bomb is based on the principle of
- (a) Uncontrolled fission reaction  
(b) Controlled fission reaction  
(c) Fusion reaction  
(d) Thermonuclear reaction

13. Avalanche breakdown is primarily dependent on the phenomenon of

- (a) Collision
- (b) Ionization
- (c) Doping
- (d) Recombination

14. According to the laws of Boolean algebra, the expression  $(A+AB)$  is equal to

- (a) A
- (b) B
- (c) AB
- (d) BA

15. In amplitude modulation, the band width is

- (a) Equal to the signal frequency
- (b) Twice the signal frequency
- (c) Thrice the signal frequency
- (d) Four times the signal frequency