

Section-A

Multiple Choice Questions (MCQ's)

Q.1: Choose the correct Answer for each from the given options:

- (i) If the distance between two charged bodies is halved then magnitude of the electric force between them becomes.
 (a) Double (b) Half (c) Four times (d) One forth
- (ii) The unit of electromotive force is _____
 (a) Electron volt (b) Newton (c) Volt (d) Kilowatt hour
- (iii) isobaric changes in a gas show that there is no change in:
 (i) Internal energy (b) Pressure (c) Volume (d) Temperature
- (iv) Lens's law is in accordance with the law of conservation of:
 (a) Mass (b) Momentum (c) Angular momentum
 (d) Energy
- (v) The properties of _____ are similar to the alpha particles.
 (a) Protons (b) X-rays (c) Electrons (d) Neutrons
- (vi) 77°F is equal to:
 (a) 15°C (b) 25°C (c) 35°C (d) 45°C
- (vii) Charge per unit area is called:
 (a) Electric flux (b) Charge density (c) Electric intensity
 (d) Electromotive force
- (viii) The mass of a _____ position is equal to the mass of:
 (a) Proton (b) Neutron (c) Electron (d) Photon
- (ix) When electrons in hydrogen atoms jump from higher orbits to the first orbit, the set of lines emitted is called.
 (a) Protons are added (b) Positron are added
 (c) Electrons are added (d) Electrons are removed
- (x) When electrons in hydrogen atoms jump from higher orbits to the first orbit, the set of lines emitted is called.
 (a) Lyman series (b) Balmer series
 (c) Paschen series (d) Pfund series
- (xi) The direction of induced current is given by:
 (a) Ampere's law (b) Gauss's law (c) Farady's law
 (d) Lenz's law

- (xii) Fahrenheit and Celsius scales coincide at:
 (a) -273 (b) -40 (c) 0 (d) 32
- (xiii) A beta particle is:
 (a) A hydrogen nucleus (b) A helium nucleus (c) Any charged particle
 (d) An electron or a positron
- (xiv) e/m of an electron was determined by:
 (a) Faraday (b) Millikan (c) Rutherford (d) Thomson
- (xv) 1 ohm and 2 ohm resistances are combined in series. If electric current flowing through 1 ohm resistance is 2A then the current flowing through 2 ohm resistance will be
 (a) $1/2\text{A}$ (b) 1A (c) 2A (d) 4A
- (xvi) If a slab of dielectric is inserted between the plates of a charged capacitor then its capacitance:
 (a) increases (b) decreases (c) remains the same
 (d) becomes zero
- (xvii) In p-type semi-conductors, the majority of the charge are:
 (a) Electrons (b) Holes (c) Neutrons (d) Protons

Section-B

Short Answer

Note: Answer any EIGHT of the following questions. Each question carries 05 marks.

- Q.2: Why mercury is preferred in a thermometer for the measurement of temperature. Give any five reasons?
- Q.3: The air pressure in the tyres of a car increases during driving. Explain.
- Q.4: Calculate absolute potential at 25 cm distance from 5 C charge.
- Q.5: Do bends in a wire affect its electrical resistance? Explain.
- Q.6: A wire carries a current of 1A. How many electrons pass a point in the wire in one second?
- Q.7: A proton of charge $1.6 \times 10^{-19}\text{C}$ and mass $1.67 \times 10^{-27}\text{Kg}$ is to be held motionless between two horizontal parallel plates 5 cm apart. Find the voltage required to apply between the plates.
- Q.8: Why must an ammeter be connected in series and a voltmeter in parallel in a circuit?
- Q.9: Both potential difference and electromotive force are measured in volt. Are they same? Explain.
- Q.10: At what speed, would the mass of an electron be doubled?
- Q.11: If we succeed in stopping a photon then what happens? Explain.
- Q.12: Write any five properties of good coolant used in a nuclear reactor.
- Q.13: What is the effect of a dielectric on the capacitance of a capacitor? Explain.

Section-C

Descriptive Answer

Answer any TWO of the following questions. Each question carries 14(7+7)

- Q.14(a) Give the postulates of Einstein's special theory of relativity and discuss the consequences of this theory.

(b) State and explain first law of thermodynamics and give isochoric and isothermal processes.

Q.15(a) Three capacitance of different values are given. How should they be combined to give minimum and maximum capacitance, explain with the help of diagram.

(b) Give construction and working of a moving coil galvanometer. How can it be converted into an ammeter? Explain.

Q.16: Write notes on any TWO of the following:

(a) Toroid

(b) Nuclear fission

(c) Combination of resistances

(d) Compton effect

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