

**Class: X**  
**Subject: physics**  
**Topic: Electricity (static and current)**  
**No. of Questions: 20**  
**Duration: 60 Min**  
**Maximum Marks: 60**

1. How many electrons make 100 Coulomb?

- A.  $6.25 \times 10^{18}$  electrons.
- B.  $6.25 \times 10^{19}$  electrons.
- C.  $6.25 \times 10^{20}$  electrons.
- D.  $6.25 \times 10^{21}$  electrons.

**Ans:** C (1 electron has charge of  $1.6 \times 10^{-19}$  C. So,  $100C = 100 / (1.6 \times 10^{-19})$ )

2. What happens when ammeter is connected in parallel with the circuit?

- A. Ammeter stops following ohm's law.
- B. Ammeter shows the same value of current as when connected in series.
- C. Ammeter burns out.
- D. Ammeter becomes Voltmeter.

**Ans:** C. (Ammeter has very small resistance. So, when connected in parallel, very high current flows through the ammeter and it burns out)

3. Why are alloys commonly used in electrical heating devices?

- A. Alloys have high resistivity.
- B. Alloys oxidize easily.
- C. Alloys are cheap.
- D. Alloys are poor conductors.

**Ans:** A (Alloys have high resistivity and don't oxidize easily)

4. What is the commercial unit of electrical energy?

- A. KWh.
- B. Joule/Sec.
- C.  $W/m^2$ .
- D. None of the above.

**Ans:** A. KWh

5. What are the special features of a heating wire?

- A. Low melting point.
- B. High boiling point.
- C. Low resistance.
- D. None.

**Ans:** D (High Melting point and High resistance)

6. What is the role of  $MnO_2$  in the dry cell?

- A. Acts as an electrolyte.
- B. Acts as a depolarizer.
- C. Acts as the conducting medium.
- D. Increases the voltage of the dry cell.

**Ans:** B (To maintain steady flow of current)

7. A current of 0.5A flows through a conductor having resistance of 10 ohms for half an hour. Find the amount of electrical energy consumed by this conductor?

- A. 2250 J
- B. 4500 J
- C. 9000 J
- D. 18000 J

**Ans:** B. 4500J ( $T=1800s$ ;  $P=i^2RT$ )

8. An electric bulb is rated at 220V, 200W. What is its resistance?

- A. 242 Ohms
- B. 11 Ohms
- C. 11/10 Ohms
- D. 484 Ohms

**Ans:** A. 242 Ohms ( $200 = (220)^2/R$ )

9. A piece of wire having resistance R is cut into four equal parts and these are then connected in parallel. What is the equivalent resistance?

- A. R
- B. R/4
- C. R/8
- D. R/16

**Ans:** D. Four R/4 in parallel gives R/16

10. A wire of resistivity R is stretched to twice its length. Find the new resistivity.

- A. R
- B. R/2
- C. R/4
- D. R/8

**Ans:** A. R (Resistivity doesn't depend on the dimensions.)

11. A charge of 1mC is moved from one conducting plate to another, maintained at a potential difference of 1000V. What is the energy acquired by the charge?

- A. 1000J
- B. 100J
- C. 10J

D. 1J

**Ans:** D. 1J ( $W=QV$ ;  $W=0.001 \times 1000=1J$ )

12. Which has more resistance: 100W bulb or 600W bulb?

A. Resistance doesn't depend on the power of the bulb.

B. 600W

C. 100W

D. Data insufficient.

**Ans:** B. 600W (As resistance is inversely proportional to P for constant V)

13. A wire of length  $2\pi R$  has resistance of X. It is bent in the form of a circle. Find the equivalent resistance between any two diametrically opposite points.

A.  $X/4$

B.  $X/4\pi R$

C.  $X/8\pi R$

D. Resistance would depend on the diametrical points chosen.

**Ans:** A.  $X/4$  ( $X/2$  is parallel with  $X/2$  for any two diametrically opposite points)

14. When a piece of polythene is rubbed with wool, a charge of  $+2 \times 10^{-7}$  C is developed on the wool. What is the change in the mass of the wool?

A. Wool's mass increases by  $11.38 \times 10^{-19}$  kg

B. Wool's mass decreases by  $11.38 \times 10^{-19}$  kg

C. Wool's mass increases by  $5.69 \times 10^{-19}$  kg

D. Wool's mass increases by  $5.69 \times 10^{-19}$  kg

**Ans:** B. As wool develops positive charge, it must have lost electrons, so its weight decreases.

No. of electrons transferred,  $n=q/e$ ;

Mass transferred = mass of electrons  $\times n = 11.38 \times 10^{-19}$  kg

15. The resistance of a wire of length 1m and area of cross-section  $25\text{cm}^2$  is 400 Ohm. Find the resistance of the wire of same metal of 5m long and area of cross section of  $1\text{mm}^2$ .

- A.  $5 \times 10^6$  Ohm
- B.  $5 \times 10^4$  Ohm
- C.  $5 \times 10^2$  Ohm
- D. 5 Ohm

**Ans:** A. (Calculate resistivity from  $R=\rho l/A$  which is  $1\text{ohm-metre}$ . So,  $R=1 \times 5/A$ )

16. Which of the following doesn't represent electrical power in the circuit?

- A.  $I^2R$
- B. VI
- C.  $V^2/R$
- D.  $IR^2$

**Ans:** D.  $IR^2$

17. Plot of Power vs  $I^2$  for a resistance R is,

- A. Straight line
- B. Parabola
- C. Ellipse
- D. Hyperbola

**Ans:** A. Straight line as P is directly proportional to  $(I^2)$  and proportionality constant is R.

18. A current of 0.2 Ampere flows through a conductor of resistance  $4.5 \Omega$ . Calculate the potential difference at the ends of the conductor

- A. 9V
- B. 0.9V
- C. 0.09V
- D. 0.009V

**Ans:** B. 0.9V

19. A torch bulb when cold has  $1\Omega$  resistance. It draws a current of 0.3 Ampere when glowing from a source of 3 V. Calculate the difference in the resistance of the bulb when glowing.

- A. 100hm
- B. 1 Ohm
- C. 9 Ohm
- D. 0.9 Ohm

**Ans:** C. 9 ohm

20. When a piece of polythene is rubbed with wool, a charge of  $+2 \times 10^{-7}$  C is developed on the wool. What is the number of charged particles gained by wool?

- A.  $1.25 \times 10^{12}$  particles are gained.
- B.  $2.5 \times 10^{12}$  particles are gained.
- C.  $5 \times 10^{12}$  particles are gained.
- D. Wool doesn't gain any particle.

**Ans:** Electrons are transferred. So, a positive charge means loss of electrons.