QB365 Question Paper Software
10th Standard - Science
Electricity Assertion and reason

Exam Time: 00:20 Hrs | Date: 2025-10-11
Total Marks: 10

Questions:

Assertion and reason

1. **Assertion**: The V-I graph is a straight line.
   Reason: V / I is a constant ratio.
   Codes
   (a) If both assertion and reason are true and the reason is correct explanation of assertion.
   (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
   (c) If assertion is true and reason is false.
   (d) If both assertion and reason are false.

2. **Assertion:** In a series combination of resistors the current is the same in every part of the circuit.
   Reason: The path of flow of electrons is the same.
   Codes
   (a) If both assertion and reason are true and the reason is correct explanation of assertion.
   (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
   (c) If assertion is true and reason is false.
   (d) If both assertion and reason are false.

3. **Assertion:** The bulbs are usually filled with chemically inactive gases like nitrogen and ozone.
   Reason: The heat emitted by bulb helps in glowing of these gases.
   Codes
   (a) If both assertion and reason are true and the reason is correct explanation of assertion.
   (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
   (c) If assertion is true and reason is false.
   (d) If both assertion and reason are false.

4. **Assertion:** Electric fan works on principle of magnetic effect of current.
   Reason: Electric generator works on principle of electromagnetic induction.
   Codes
   (a) If both assertion and reason are true and the reason is correct explanation of assertion.
   (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
   (c) If assertion is true and reason is false.
   (d) If both assertion and reason are false.

5. **Assertion:** The connecting wires are made of copper.
   Reason: The electrical conductivity of copper is high.
   Codes
   (a) Both A and R are true, and R is correct explanation of the assertion.
   (b) Both A and R are true, but R is not the correct explanation of the assertion.
   (c) A is true, but R is false.
   (d) A is false, but R is true.

6. **Assertion:** A bird perches on a high power line and nothing happens to the bird.
   Reason: The circuit is incomplete for the bird sitting on high power line.
   Codes
   (a) Both A and R are true, and R is correct explanation of the assertion.
   (b) Both A and R are true, but R is not the correct explanation of the assertion.
   (c) A is true, but R is false.
   (d) A is false, but R is true.

7. **Assertion:** Bending a wire does not affect electrical resistance.
   Reason: Resistance of a wire is proportional to resistivity of material.
   Codes
   (a) Both A and R are true, and R is correct explanation of the assertion.
   (b) Both A and R are true, but R is not the correct explanation of the assertion.
   (c) A is true, but R is false.
   (d) A is false, but R is true.

8. **Assertion:** The coil of a heater is cut into two equal halves and only one of them is used into heater, The heater will now require half the time to produce the same amount of heat.
   Reason: The heat produced is directly proportional to square of current.
   Codes
   (a) Both A and R are true, and R is correct explanation of the assertion.
   (b) Both A and R are true, but R is not the correct explanation of the assertion.
   (c) A is true, but R is false.
   (d) A is false, but R is true.

9. **Assertion:** A voltmeter and ammeter can be used together to measure resistance but not power.
   Reason: Power is proportional to voltage and current.
   Codes
   (a) Both A and R are true, and R is correct explanation of the assertion.
   (b) Both A and R are true, but R is not the correct explanation of the assertion.
   (c) A is true, but R is false.
   (d) A is false, but R is true.

10. **Assertion:** The wires supplying current to an electric heater are not heated appreciably.
    Reason: Resistance of connecting wires is very small and $H \propto R$.
    Codes
    (a) Both A and R are true, and R is correct explanation of the assertion.
    (b) Both A and R are true, but R is not the correct explanation of the assertion.
    (c) A is true, but R is false.
    (d) A is false, but R is true.

Answers Key:

Assertion and reason

1. (a) If both assertion and reason are true and the reason is correct explanation of assertion.
2. (a) If both assertion and reason are true and the reason is correct explanation of assertion.
3. (d) If both assertion and reason are false.
4. (b) If both assertion and reason are true but reason is not a correct explanation of assertion.
5. **(a):** Due to high electrical conductivity of copper, it conducts the current without offering much resistance.
6. **(a):** Electric shock is due to the electric current flowing through a living body. When the bird perches on a single high power line, no current passes through its body because its body is at equipotential surface, i.e., there is no potential difference. While when man touches the same line, standing bare foot on ground, the electrical circuit is completed through the ground. The hands of man are at high potential and his feets are at low potential. Hence large amount of current flows through the body of the man and therefore, gets a fatal shock.
7. **(b):** Resistance of wire, $R = \rho\frac{l}{A}$
   where p is resistivity of material which does not depend on the geometry of wire. Since when wire is bended, resistivity, length and area of cross-section do not change, therefore resistance of wire also remains same.
8. **(b):** Since in the given case the voltage is same, therefore, $H = \frac{V^2}{R}t = \text{ constant.}$ Hence, if R is halved, t must be halved.
9. **(d):** As R = V / I and P = VI, by measuring V and I simultaneously in circuit we can measure both resistance and power, using the given relation.
10. **(a):** Resistance of the connecting wires is much smaller than the electric appliances to which current is supplied by the wires.