

**BCM SCHOOL BASANT AVENUE, DUGRI ROAD, LUDHIANA**

**CLASS – X SCIENCE**

**(PHYSICS - ELECTRICITY & BIO - HEREDITY)**

**(28/10/2024)**

**MCQs**

1. If a normal cell of human body contains 46 pairs of chromosomes then the numbers of chromosomes in a sex cell of a human being is most likely to be:  
(a) 60  
(b) 23  
(c) 22  
(d) 40
2. If the current  $I$  through a resistor is increased by 100% the increased in power dissipation will be (assume temperature remain unchanged)  
(a) 100% (b) 200% (c) 300% (d) 400%

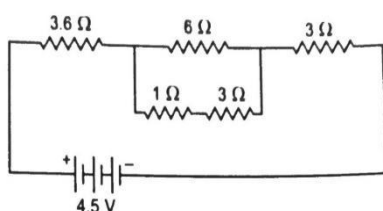
**Assertion (A)/Reason (R)**

Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.
  - (b) Both A and R are true but R is not the correct explanation of A.
  - (c) A is true but R is false.
  - (d) A is false but R is true.
3. Assertion: In humans, height is a trait which shows variation.  
Reason: Some humans are very tall, some have medium height whereas others are short heighted.
  4. Assertion: Alloys are commonly used in electrical heating devices, like electrical iron, toasters etc.  
Reason: Alloys do not oxidise (burn) readily at high temperatures.

**Q/A**

5. 'n' resistors each of resistance  $R$  are first connected in series and then in parallel. What is the ratio of the total effective resistance of the circuit in series combination and parallel combination?
6. A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other.  
(a) List your observations regarding :  
(i) Colour of stem in their  $F_1$  progeny  
(ii) Percentage of brown stemmed plants in  $F_2$  progeny if plants are self pollinated.  
(iii) Ratio of GG and Gg in the  $F_2$  progeny.  
(b) Based on the findings of this cross, what conclusion can be drawn?
7. Study the given circuit diagram and calculate the following



- (a) Effective resistance & current in the circuit
  - (b) Potential difference across 6 ohm
  - (c) Heat produced by 1ohm resistor in 2 minutes.
8. "It is a matter of chance whether a couple will have a male or a female child." Justify this statement by drawing a flow chart.

## **CASE STUDY**

9. Electricity requires an electric path to flow and there are many conducting materials used for this purpose. There are non-conducting materials which are used as insulation during working on live-lines. Permanent indoor wiring is responsible for bringing electricity throughout your home. In house hold wiring, switches, holders and sockets should be fixed on wooden/ sunmica boards and blocks. Nowadays, there are many semiconducting materials which are used to reduce the voltage and also drop the current flow. This will reduce our consumption of electrical energy.
- (a) In which combination household wiring is done? Why?
  - (b) Electric current flows through a metallic conductor from its one end A to other end B. Which end of the conductor is at higher potential? Why?
  - (c) When a battery is connected to a closed circuit, charge flow in the circuit almost instantaneously. Explain.
  - (d) How will the resistivity of a conductor change when its length is tripled by stretching it?
10. Reproduction results in variation from one generation to the next. The variation produced in the organisms during the successive generation gets accumulated over a long period of time in an organism. After several generations these variations comes up in the organisms and the organisms start showing different characteristics and hence leads to the appearance of new species. The main advantage of variation in a species is that it increases the chance of its survival in a changing environment. The organisms which show positive variation, survive. Those who do not show variations get extinct.
- a) What are variations?
  - b) Why are the variations accumulated over generations?
  - c) What are the positive variations?
  - d) An elephant learns a trick at the circus. Will his offspring's also know the trick by birth? Support your answer with reasons