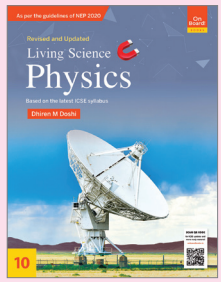
ICSE Living Science PHYSICS

Class 10



Multiple-Choice Questions

Chapter 9: ELECTRICAL POWER AND HOUSEHOLD CIRCUITS

1. Which of the following is the correct expression of electrical energy? In the given expressions, symbols have their usual meaning.

   (a) $W = I^2Rt$ (b) $W = IR^2t$ (c) $W = IRt^2$ (d) $W = I^2R^2t$

   Ans: (a)

2. An electric bulb operates in 230 V and draws 3 A current. How much energy will it consume if it remains switched on for 10 minutes?

   (a) 4.14 kJ (b) 41.4 kJ (c) 414 kJ (d) 4140 kJ

   Ans: (c)

3. The SI unit of electrical energy is

   (a) watt. (b) ampere. (c) joule. (d) coulomb.

   Ans: (c)

4. In the definition of electrical power, the rate of dissipation or consumption of which electrical parameter is considered?

   (a) Electric current (b) Electrical energy (c) Electrical resistance (d) Electric potential

   Ans: (b)

5. Which of the following mathematical expressions is correct about electrical power? The symbols here have their usual meaning.

   (a) $P = VI$ (b) $P = I^2R$ (c) $P = \frac{V^2}{R}$ (d) All of these

   Ans: (d)

6. What does the rating of an electrical appliance as 220 V, 60 W mean?

   (a) It consumes 60 J of energy per hour when the applied voltage is 220 V.

   (b) It consumes 60 J of energy per minute when the applied voltage is 220 V.

   (c) It consumes 60 J of energy per second when the applied voltage is 220 V.

   (d) It consumes 60 kJ of energy per second when the applied voltage is 220 V.

   Ans: (c)

7. An electrical appliance, A, is rated as 220 V, 60 W. Another electrical appliance, B, is rated as 220 V, 40 W. Which of the following is correct about the two appliances?

   (a) B has more resistance than A.

   (b) B has less resistance than A.

   (c) B has same resistance as A.

   (d) The resistances of A and B cannot be calculated from the given information.

   Ans: (a)

8. An electrical appliance is marked 250 V–60 W. Calculate the maximum current that can be safely passed through this appliance at the given voltage.

(a) 0.10 A **(b)** 0.20 A **(c)** 0.24 A **(d)** 0.50 A

Ans: **(c)**

9. In a house there are three 220 V–100 W lamps, three 220 V–110 W fans, a 220 V–120 W television set, and a refrigerator of 220 V–180 W marking. What will be the amount of electrical energy consumed in 30 days if the refrigerator is not switched off at all, and other appliances are used for 12 hours a day? Answer in the nearest whole number of units.

(a) 400 units **(b)** 300 units **(c)** 350 units **(d)** 200 units

Ans: **(a)**

10. How much is the volt of electric power generated at electric power stations?

(a) 1 V **(b)** 1 kV **(c)** 11 kV **(d)** 110 kV

Ans: **(c)**

11. From electric power station to grid sub-station, which of the following is correct?

(a) Voltage is stepped up. **(b)** Voltage is stepped down.

(c) Voltage remains constant. **(d)** There is no fixed process followed.

Ans: **(a)**

12. Arrange the following units involved in electricity generation to supply at home in the order they are arranged from start to the end.

(a) Main sub-station → Electric power station → Grid sub-station → City sub-station

(b) City sub-station → Electric power station → Grid sub-station → Main sub-station

(c) Grid sub-station → Electric power station → Main sub-station → City sub-station

(d) Electric power station → Grid sub-station → Main sub-station → City sub-station

Ans: **(d)**

13. What is the potential of the neutral wire in the household wiring?

(a) 220 V **(b)** –220 V **(c)** 0 V **(d)** 11 kV

Ans: **(c)**

14. In our household wiring, the main line at the distribution box is divided into two main circuits. What is the maximum current carrying capacity of the lines?

(a) 0 A and 2 A **(b)** 2 A and 5 A **(c)** 5 A and 10 A **(d)** 5 A and 15 A

Ans: **(d)**

15. What is a fuse wire made of?

(a) Copper – 63% and aluminium – 37% **(b)** Tin – 63% and lead – 37%

(c) Copper – 37% and aluminium – 63% **(d)** Tin – 37% and lead – 63%

Ans: **(b)**

16. What is the correct formula to measure the increase in temperature (ΔT) in a fuse wire through which I amp of current is flowing and whose radius is r?

(a) $\Delta T \propto \frac{I^2}{r^2}$ **(b)** $\Delta T \propto \frac{I^3}{r^2}$ **(c)** $\Delta T \propto \frac{I^2}{r^3}$ **(d)** $\Delta T \propto \frac{I^3}{r^3}$

Ans: **(c)**

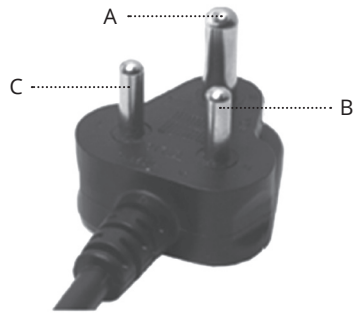
17. Which of the following statements is correct?

(a) A switch is always connected in the live wire. **(b)** A switch is always connected in the neutral wire.

(c) A switch is always connected in the earth wire. **(d)** All of these.

Ans: **(a)**

18. This is a three-pin plug. Identify A, B, and C in it.



(a) A – live, B – earth, C – neutral
(b) A – earth, B – neutral, C – live
(c) A – live, B – neutral, C – earth
(d) A – neutral, B – earth, C – live

Ans: (b)

19. The principle of earthing assumes the earth to be

(a) a big sink or acceptor of electric charge.
(b) a big supplier of electric charge.
(c) a big repeller of electric charge.
(d) All of these.

Ans: (a)

20. What is the colour code for live wire according to the new convention?

(a) Red
(b) Brown
(c) Light blue
(d) Green

Ans: (b)