QB365 Question Bank Software Study Materials

Electricity Important 2 Marks Questions With Answers (Book Back and Creative)

10th Standard

Science

Total Marks : 60

2 Marks

30 x 2 = 60

1) Define the unit of current.

Answer : (i) The SI unit of current is ampere (A).

(ii) The current flowing through a conductor is said to be one ampere, when a charge of one coulomb flows across any cross-section of a conductor in one second.

$$1\ ampere = \frac{1\ coulomb}{1\ second}$$

2) What happens to the resistance, as the conductor is made thicker?

Answer : (i) Resistance is inversely proportional to area of cross section. $\mathbf{R}\alpha\frac{l}{A}$

(ii) A thicker wire has Iarger area of cross section and hence the resistance decreases.

3) Why is tungsten metal used in bulbs, but not in fuse wires?

Answer : (i) Melting point of tungsten is very.

(ii) Hence it is used in a filament bulb.

(iii) But a fuse wire should be made up of material which has low melting point.

4) Name any two devices, which are working on the heating effect of the electric current.

Answer : (i) Electric heater.

(ii) Electric iron work on the heating effect of current.

5) What happens to resistance of the conductor

(i) when temperature is increased

(ii) length is doubled

(iii) area of cross section is increases

Answer : (i) When temp is increased, resistance is increased

(ii) When length is doubled, resistance is increased

(iii) When area of cross section is increased, resistance is increased.

6) Write the difference between conductor and insulator.

Answer :

S.No	Conductor	Insulator
i)	Materials which	Materials which do not allow current
ii)	Resistivity is less	Resistivity is high

7) Write the difference between electric energy and electric power.

Answer :

	Electric power	Electric energy
i)	Rate of consumption of electric energy	The work done by the source in maintaining the flow of electric current
ii)	P = $\frac{W}{t}$	E = P x t
iii)	SI unit is watt	SI unit is joule

Write electrical use of the components in electrical circuit

8) Write electrical use of the components in electrical circuit.

Answer : (i) Resistor is used to fix the magnitude of the current through the circuit

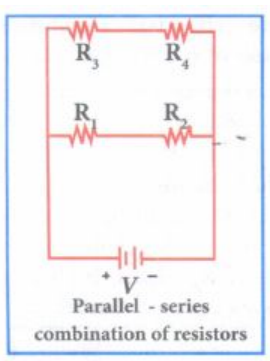
(ii) Rheostat is used to fix the magnitude of the current through the circuit

(iii) Ammeter is used to measure the current.

(iv) Voltmeter is used to measure the potential difference.

9) Find the total resistance of parallel connection of series resistors?

Answer : A connection of a set of series resistors connected in a parallel circuit, is a parallel-series circuit. Let R_1 and R_2 be connected in series to give an effective resistance of R_{s1}. Similarly, let R_3 and R_4 be connected in series to give an effective resistance of R_{s2}. Then, both of these serial segments are connected in parallel (Figure).



Parallel - series combination of resistors

Using the equation $R_s = R_1 + R_2$

$R_{s1} = R_1 + R_2'$

$R_{S2} = R_3 + R_4$

Finally, using equation $\left(\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}\right)$, the net effective resistance is given by $\frac{1}{R_{total}} = \frac{1}{R_{S1}} + \frac{1}{R_{S2}}$

10) Give the criteria for resistors connected in series and parallel.

Answer :

Criteria	**Series**	**Parallel**
Equivalent resistance	More than the highest resistance.	Less than the lowest resistance.
Amount of current	Current is less as effective resistance is more.	Current is more as effective resistance is less.
Switch On/Off	If one appliance is disconnected, others also do not work.	If one appliance is disconnected, others will work independently.

11) Write about LED television.

Answer : (i) LED Television is one of the most important applications of Light Emitting Diodes.

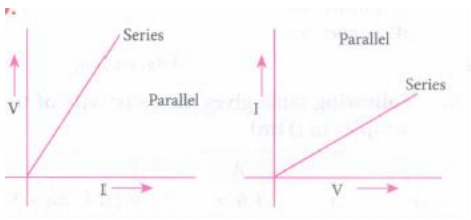
(ii) An LED TV is actually an LCD TV (Liquid Crystal Display) with LED display.

(iii) An LED display uses LEDs for back light and an array of LEDs act as pixels.

(iv) LEDs emitting white light are used in monochrome (black and white) TV; Red, Green and Blue (RGB) LEDs are used in colour television.

12) What is MCB?

Answer : An MCB is a switching device, which can be activated automatically as well as manually. It has a spring attached to the switch, which is attracted by an electromagnet when an excess current passes through the circuit. Hence, the circuit is broken and the protection of the appliance is ensured.

13) 

Two students perform the experiments on series and parallel combinations of two given resistors R_1 and R_2 and plot the following V-I graphs.

Answer : In first graph, slope of I-V graph = resistance. Since in series combination, resistance is more than the resistance in parallel combination, therefore slope of I-V graph for series combination is more than the slope of resistance.

V-I graph= $\frac{1}{resistance}$

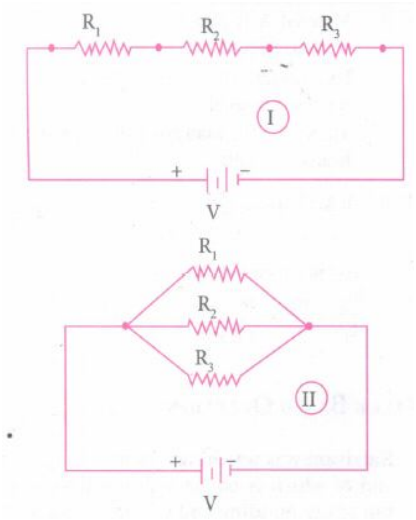
Hence, graph is correctly labelled. In second graph, slope of resistance.

14) Two electric circuits I and II are shown in figure.

(i) Which of the two circuits has more resistance?

(ii) Through which circuit, more current passes?

(iii) In which circuit, the potential difference across each resistor is equal.



Answer : (i) Equivalent resistance of series combination of resistors is more than the equivalent resistance of the parallel combination of resistors.

So, the resistance of circuit I is more than the resistance of circuit II.

(ii) Since, current $\alpha \frac{1}{resistance}$

∴ So current in circuit II is more than the current in circuit I.

(iii) Potential difference across each resistor is equal in circuit II.

15) Write about electric circuit.

Answer : An electric circuit is a closed conducting loop (or) path, which has a network of electrical components through which electrons are able to flow. This path is made using electrical wires so as to connect an electric appliance to a source of electric charges (battery).

16) Define Volt.

Answer : The SI unit of electric potential or potential difference is volt (V). The potential difference between two points is one volt, if one joule of work is done in moving one coulomb of charge from one point to another against the electric force.

1 volt = 1 joule/ 1 coulomb.

17) Define Unit of Resistance.

Answer : The SI unit of resistance is ohm and it is represented by the symbol Ω. Resistance of a conductor is said to be one ohm if a current of one ampere flows through it when a potential difference of one volt is maintained across its ends.

1 Ohm = 1 volt/ 1 ampere.

18) Tabulate the Resistivity of some materials.

Answer :

Nature of the Material	**Material**	**Resistivity (Ωm)**
Conductor	Copper	1.62×10^{-8}
	Nickel	6.84×10^{-8}
	Chromium	12.9×10^{-8}
Insulator	Glass	10^{10} to 10^{14}
	Rubber	10^{13} to 10^{16}

19) What is called heating effect of current?

Answer : A part of the energy from the source can be converted into useful work and the rest will be converted into heat energy. Thus, the passage of electric current through a wire, results in the production of heat. This phenomenon is called heating effect of current

20) Define Power.

Answer : (i) Power is defined as the rate of doing work.

(ii) Power = Voltage x current

(iii) P = VI

21) What is called electric power?

Answer : The electric power is the product of the electric current and the potential difference due to which the current passes in a circuit.

22) What is the unit of electric power?

Answer : The SI unit of electric power is watt. When a current of 1 ampere passes across the ends of a conductor, which is at a potential difference of 1 volt, then the electric power is P = 1 volt x 1 ampere = 1 watt.

23) Write the factors for consumption of electricity.

Answer : i) Amount of electric power
ii) Duration of Usage

24) What is called consumed electrical energy?

Answer : Electrical energy consumed is taken as the product of electric power and time of usage. For example, if 100 watt of electric power is consumed for two hours, then the power consumed is 100 x 2 = 200 watt hour.

25) What are the colours produced from manufacture of LED?

Answer : Red, Green, Yellow and Orange.

26) Explain seven segment display.

Answer : A 'Seven Segment Display' is the display device used to give an output in the form of numbers or text. It is used in digital meters, digital clocks, micro wave ovens, etc. It consists of 7 segments of LEDs in the form of the digit 8. These seven LEDs are named as a, b, c, d, e, f and g . An extra 8th LED is used to display a lot.

27) What is conductance? Give its unit.

Answer : Conductance is defined as the reciprocal of its resistance. Its unit is ohm^{-1}.

28) How does the overloading happen?

Answer : Overloading happens when a large number of appliances are connected in series to the same source of electric power.

29) Define the unit of electrical energy consumption.

Answer : i) Consumption of clectrical energy is measured and expressed in watt hour.
ii) SI unit is watt second.
iii) This larger unit is kilowatt hour (kWh).
iv) 1kWh= 1000 watt hour = 1000 x (60 x 60) watt second = 3.6 x 10J.

30) Which instrument is used to measure the potential difference? How will you connect it in a circuit?

Answer : i) Voltmeter is used to measure the potcntial diference between two points in the circuit.
ii) There are two types of method for connecting a voltmeter in an electric circuit.
iii) It is connected in parallel combination with a resistance.