

Class – X (2019-20)
Sub. – Science Worksheet
PHYSICS (Unit-1&2)

1. The value of current I flowing in a given resistor for the corresponding values of potential difference V across the resistor are given below :

I (ampere)	0.5	1.0	2.0	3.0	4.0
V (volt)	1.6	3.4	6.7	10.2	13.2

Plot a graph between V and I and calculate the resistance of the resistor.

OR

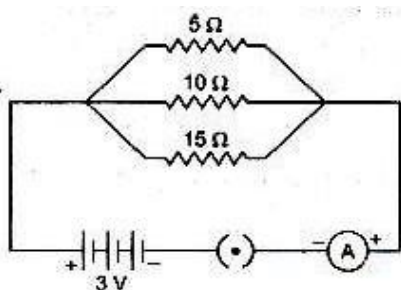
A coil of insulated copper wire is connected to a galvanometer. What would happen if bar magnet is
(a) pushed into the coil (b) withdrawn from inside the coil (c) held stationary inside the coil.

2. Draw a circuit diagram to show three resistors connected in parallel with a cell and a key. Write formula for the equivalent resistance R of this combination if the individual resistances of the resistors are R_1 , R_2 and R_3 .
3. In an experiment to study the relation between the potential difference across a resistor and the current through passing it, a student recorded the following observations.

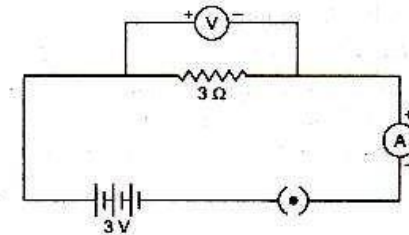
Potential difference, V (in volts)	1.0	2.2	3.3	4.4	6.6
Current, I (In amperes)	0	0.2	0.3	0.4	0.6

On examining the above observations, the teacher asked the students to reject one set of readings as the values did not satisfy the conditions with the rest. Which one of the above sets of readings can be rejected? Calculate the mean value of resistance of the resistor based on the remaining four sets of readings.

4. Show how would you connect the three resistors, each of resistance $6\ \Omega$. so that the combination has a resistance of (i) $9\ \Omega$ (ii) $4\ \Omega$
5. Define magnetic field. Describe an activity to draw magnetic field lines around a bar magnet from one pole to another.
6. Explain the following:
- Why tungsten is used almost exclusively for filament of electric lamps?
 - Why are elements of electric heating devices such as bread toasters and electric iron made up of alloy rather than a pure metal?
 - Why series circuit is not used for domestic circuits?
 - How does the resistance of wire vary with its area of cross-section?
 - Why are copper and aluminium wires usually employed for electricity transmission?
7. In the circuit diagram given below, calculate:
- the total effective resistance of the circuit.
 - the total current in the circuit.



8. What would be the reading of the ammeter and voltmeter in the given circuit?



9. Why the cord of an electric heater does not glow while the heating element does?
10. An electric lamp of resistance $100\ \Omega$, a toaster of resistance $50\ \Omega$ and a water filter of resistance $500\ \Omega$ are connected in parallel to a $220\ \text{V}$ source. What is the resistance of an electric iron connected to the same source that takes as much current as all the three appliances and what is the current that passes through it?
11. Explain different ways to induce current in a coil?

OR

List three methods of producing magnetic field.

12. Two resistors having resistances of $4\ \Omega$ and $6\ \Omega$ respectively are connected in a circuit. It was found that the total resistance in the circuit is less than $4\ \Omega$. In what way the resistances would have been connected?
- 13.a) What is the difference between direct current and alternating current? Write one important advantage of using alternating current.
- b) An air-conditioner of $2\ \text{KW}$ is used in an electric circuit having a fuse of $10\ \text{A}$ rating. If the potential difference of the supply is $220\ \text{V}$, will the fuse be able to withstand when the air-conditioner is switched on? Justify your answer.

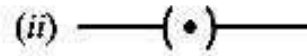
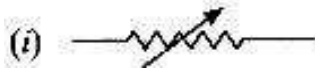
OR

- (a) Draw a schematic labeled diagram of a domestic wiring circuit which includes
(i) a main fuse (ii) a power meter (iii) one light point and (iv) a power plug
- (b) Why is it necessary to connect an earth wire to electric appliances having metallic covers?
14. In Ohm's experiment, it is advised to take out the key from the plug when the observations are not being taken. Why?
15. Two resistors are connected in series and then in parallel. What effect will it have on the readings of voltmeter and ammeter and why?
16. Define the term volt.
17. The following bulbs are rated $40\ \text{W}$, $60\ \text{W}$ and $100\ \text{W}$. Which one will glow the brightest when connected in series to a supply of $220\ \text{V}$?
18. What is an electric circuit? Distinguish between an open and a closed circuit.
19. Name the commercial unit of electrical energy. Convert it into joule. What is the other name of this commercial unit?
20. Why two magnetic field lines does not intersect each other?
21. In what way household appliances should be connected and why?
22. How does the strength of magnetic field at the centre of a circular coil of wire depend on :
(a) the radius of the coil?
(b) the number of turns of wire in the coil?
(c) the strength of the current flowing in the coil?

OR

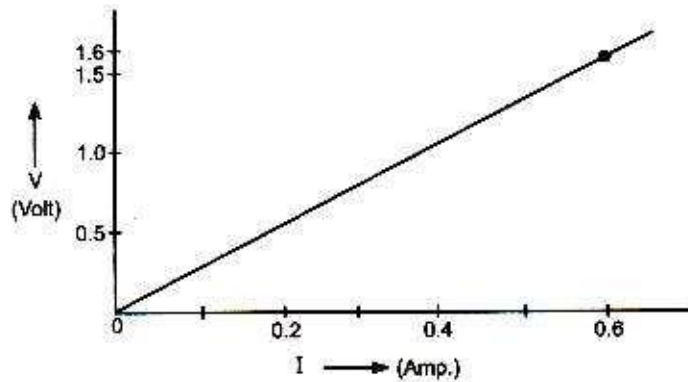
List three properties of magnetic lines of force.

23. a) Name an instrument that measures electric current in a circuit. Define the unit of electric current.
 b) What do the following symbols mean in the circuit diagram?



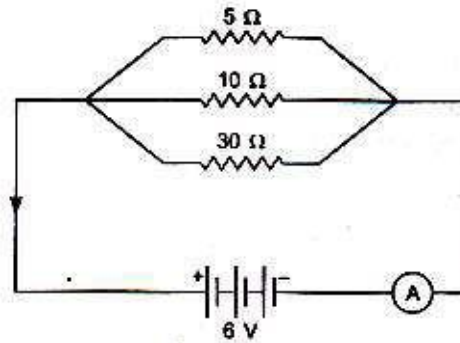
c) An electric circuit consisting of a 0.5 m long nichrome wire XY, an ammeter, a voltmeter, four cells of 1.5 V each and a plug key was set up.

- i) Draw a diagram of this electric circuit to study the relation between the potential difference maintained between the points X and Y and the electric current flowing through XY.
 ii) Following graph was plotted between V and I values :



What would be the value of V/I ratios when the potential difference is 0.8V, 1.2V and 1.6V respectively? What conclusion do you draw from these values?

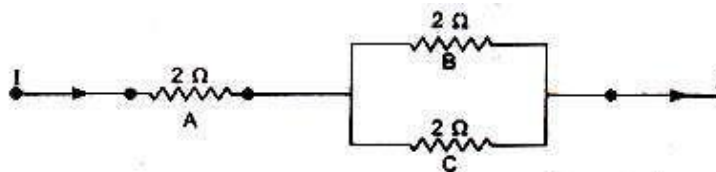
24. a) For the circuit shown in the diagram, calculate



- i) Value of current through the 30 Ω resistor.
 ii) total resistance of the circuit.
 b) Give two advantages of connecting electrical devices in parallel with battery.

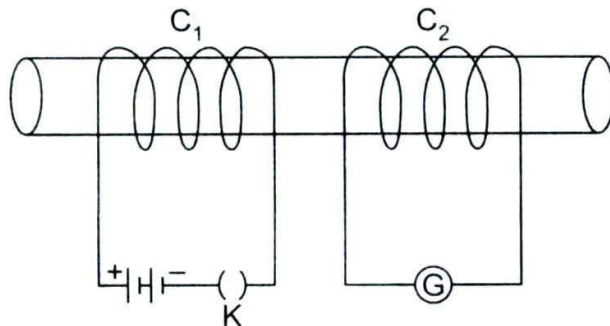
OR

a) Three 2 Ω resistors A, B and C, are connected as shown in figure. Each of them dissipates energy and can withstand a maximum power of 18 W without melting. Find the maximum current that flow through the three resistors.



b) A potential difference V is applied across a conductor of length L and diameter d . How is the resistance R of the conductor affected, when in turn (i) V is halved (ii) L is halved and (iii) D is doubled? Justify your answer in each case.

25. Explain the underlying principle and working of an electric generator with a suitable well labeled diagram. What is the function of brushes?
26. Two coils C_1 and C_2 are wrapped around a non-conducting cylinder. Coil C_1 is connected to a battery and key and C_2 galvanometer G . On pressing the key (K), current starts flowing in the coil C_1 . State your observation in the galvanometer :



- When key K is pressed.
- When current in the coil C_1 is switched off.
- When the current is passed continuously through coil C_1 .
- Name and state the phenomenon responsible for the above observation.
- Write the name of the rule that is used to determine the direction of current produced in the phenomena.

CHEMISTRY (Unit-1,2)

- State the reason for the following :
 - Potato chips manufacturers usually flush bags of chips with nitrogen gas.
 - Iron articles lose their shine gradually.
 - Food should be kept in air tight containers.
- Tooth enamel is the hardest substance in our body.
 - Name the compound it is made up of.
 - At what pH of mouth does it get corroded?
 - State the role of bacteria in mouth Suggest a method to prevent tooth decay.
- Write the chemical name of $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ and Na_2CO_3 .
 - Write the significance of $10\text{H}_2\text{O}$ in the substance.
 - Mention the term used for water molecules attached with the salt.
- What are bases? How does a base like sodium hydroxide react with zinc?
- Which of the following pair will show displacement reaction and why?
 - FeSO_4 and copper metal.
 - FeSO_4 and Aluminium metal.
- What is the pH range for a base?
 - How the strength of basic solution be inversed?
 - Give an example of strong and weak base.
- What is the litmus solution? What is its colour in (i) neutral (ii) acidic (iii) base solution

8. What happens when :
 - a) limited supply of CO_2 is passed through lime water?
 - b) CO_2 is passed through lime water in excess.
9. Write chemical equation for the reactions taking place when:
 - a) Magnesium react with dil.HCl.
 - b) Iron react with steam.
 - c) Copper is strongly heating in air.
10. On opening the soda water bottle, the dissolve CO_2 comes out. Would the pH of the solution increases or decrease as the gas comes out? Explain your answer.
11. Name the acid produced in the stomach. What happens if there is an excess of acid in the stomach? How can it be cured? Name one antacid.
12. Identify the substances that are oxidized and reduced in the following reaction and also identify their oxidising and reducing agent.
 - i) $2\text{PbO} + \text{C} \rightarrow 2\text{Pb} + \text{CO}_2$
 - ii) $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$
 - iii) $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$
13. Balance the following chemical equations :
 - i) $\text{BaCl}_2 + \text{Al}_2(\text{SO}_4)_3 \rightarrow \text{BaSO}_4 + \text{AlCl}_3$
 - ii) $\text{Na} + \text{H}_2\text{O} \rightarrow \text{NaOH} + \text{H}_2$
 - iii) $\text{Ca}(\text{OH})_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$
 - iv) $\text{Al} + \text{CuCl}_2 \rightarrow \text{AlCl}_3 + \text{Cu}$
 - v) $4\text{Fe} + \text{O}_2 + x\text{H}_2\text{O} \rightarrow \text{Fe}_2\text{O}_3 \cdot 2x\text{H}_2\text{O}$
 - vi) $\text{HNO}_3 + \text{Ca}(\text{OH})_2 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$
 - vii) $\text{NaCl} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{HCl}$
 - viii) $\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_4 + \text{H}_2$
 - ix) $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{NaCl} + \text{BaSO}_4$
14. Why do HCl, HNO_3 , etc show acidic charatcer in aqueous solution while solution of compound like alcohol and glucose do not show acidic character?
15. Plaster of Paris should be stored in moisture proof container. Explain why?

BIOLOGY (Unit-1,2)

1. What does the high level of total coliform count in river Ganga indicate?
2. How is the amount of urine produced in human regulated?
3. What are the methods used by the plants to get rid of excretory products?
4. Although solar cooker has many advantages, yet not many families use solar cooker for cooking food. However, it is very good to know that solar water heater is been widely used in India. Kapil was feeling proud after installation of solar water heater on his roof top. He knows that he has contributed towards the conservation of environment. Now, answer the following questions:
 - (a) Write one advantage and one limitation of using a solar water heater.
 - (b) How has Kapil contributed towards the conservation of environment?
 - (c) State the values that prompted Kapil's action.
5.
 - (a) What is an ecosystem? List its two main components.
 - (b) We do not clean ponds or lakes but an aquarium needs to be cleaned regularly. Explain.

6. What are 'biodiversity hotspots'? What is the measure of the biodiversity?
7. How are the alveoli designed to maximize the exchange of gases?
8. "Energy flow in a food chain is unidirectional." Justify this statement. Explain how pesticides enter a food chain and subsequently get into our body.
9. When a student observed a temporary mount of leaf peel under a microscope, he saw two different types of cells in a leaf peel. Name these two different types of cells. On what basis can a student differentiate between these two cells?
10. State long term perspectives of management of natural resources.
11. Describe double circulation in human beings. Why is it necessary?
12. Ozone (O_3) is a molecule formed by three atoms of oxygen unlike oxygen which is required for respiration by aerobic forms, ozone is a deadly poison. However, at the higher levels of the atmosphere, ozone performs an essential function. Like other environmental problems, ozone depletion is also one that has become a major issue for all nations on the earth.
 - (a) How is ozone formed in nature?
 - (b) How can you spread awareness about the importance of ozone layer in our life?
 - (c) What values can the public learn?
13. Suggest any three methods that should be adopted to ensure that the local air and local water bodies are not polluted.
14. Elaborate three instances where human intervention saved the forests from destruction.
15. State the function of the following in the alimentary example.
 - (i) Liver
 - (ii) Gallbladder
 - (iii) Villi.
16. The activities of man had adverse effects on all forms of living organisms in the biosphere. Unlimited exploitation of nature by man disturbed the delicate ecological balance between the living and non-living components of biosphere. The unfavorable conditions created by man himself threatened the survival not only of himself but also of the entire living organisms on the mother earth. One of your classmates is an active member of 'Eco club' of your school which is creating environmental awareness amongst the school students, spreading the same in the society and also working hard for preventing environmental degradation of the surroundings.
 - (a) Why is it necessary to conserve our environment?
 - (b) State the importance of green and blue dustbins in the safe disposal of the household waste.
 - (c) List two values exhibited by your classmate who is an active member of Eco-club of your school.
17. Distinguish between exhaustible and inexhaustible resources of energy. Give one example of each.
18. (a) What is lymph? How is composition of lymph different from blood plasma? What is the direction of its flow?
 - (b) List two functions of lymphatic system.
 - (c) State differences between the blood vessels artery, vein and capillary.
19. Why are crop fields known as artificial ecosystems?
20. Biomass and Hydropower plant are both renewable and conventional sources of energy. State the advantages of generating energy from them.
21. Write the harmful effects of using plastic bags on environment. Suggest alternatives to plastic bags.
22. What are trophic levels? Give an example of food chain and state the different trophic levels in a food chain.

23. How are fats digested in our body? Where does this process takes place?

Or

Explain the role of mouth in the digestion of food.

24. What are components of circulatory system in human beings? What is the functions of these components?
25. (a) Which part of leaf is commonly used for preparing the slide of stomata?
(b) Which chemicals are used for staining and mounting in order to prepare a temporary mount of a leaf peel for observing stomata?
26. What are the various factors that causes damage to our forests?
27. In a village, vultures are found to be dead due to insecticide poisoning after eating dead animals. Vultures are very important for a food chain and their death has become a matter of great concern.
(a) What do you learn from the death of the vultures?
(b) What precaution should we take in eating our food?
(c) What should the government do to reduce biological magnification?
28. (a) List in a tabular form, three differences between aerobic respiration & anaerobic respire.
(b) Why do sportsman get cramps in their muscles during excessive or sudden physical activity?
29. (a) How is small intestine designed to absorb digested food?
(b) What is the function of digestive enzymes?