[Important Questions Related to Board Examination]

[Subject – Science] [Class – X]

[Section – A]

(PHYSICS)

1. **Write down the relation between the potential difference between two points A and B in a conductor, work done W in moving a unit charge from point B to A and the charge q.**

   Or

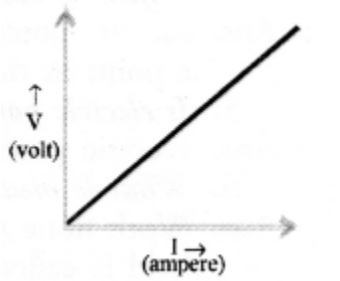
   State the relation between work, charge and potential difference for an electric circuit. [CBSE (All India) 2009, 2013]

   Or

   Express work done in an electric field in terms of charge and potential difference. (CBSE 2014)
2. **Mention the factor that maintains the flow of charge through a conductor. (CBSE 2013, 2014)**
3. **How is the direction of electric current related to the direction of flow of electrons in a wire ?**
   [CBSE (All India) 2009]
4. **How is ammeter connected in the circuit to measure electric current ? (CBSE 2011, 2012)**
5. **How is voltmeter connected in the circuit to measure potential difference ?**
6. **Define ohm's law. [CBSE 2010, 2011, 2012, 2013, 2015]**

   Or

   State the law that gives the relationship between the potential difference (V) across the two ends of a conductor and the current (I) flowing through it. (CBSE 2012)
7. **Graph is plotted between the values of potential difference (V) and current (I). What v conclusion do you draw about the relation between V and I from this graph. State this relation in your words. (CBSE 2013)**

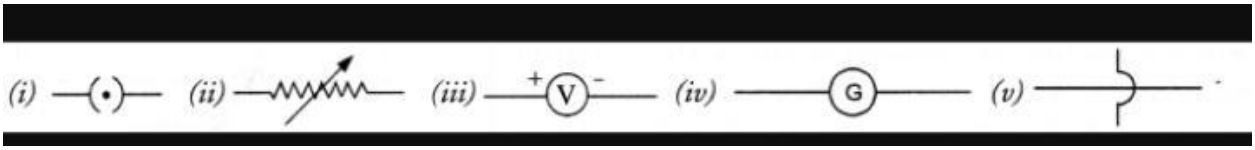


8. **The resistance of a conductor is IΩ". What is meant by this statement ? (CBSE 2010, 2011, 2012)**

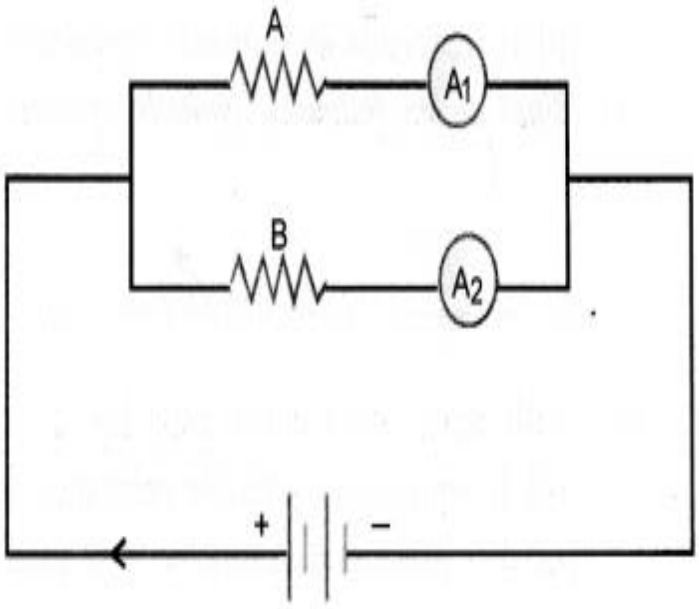
   Or

   Define 1 ohm resistance. (CBSE 2014)
9. **What does the slope of V-I graph at any point represent ?What happens to resistance of a conductor if temperature is increased ?**
10. **You have two metallic wires of resistances 60 and 30. How will you connect these wires to get the effective resistance of 20 ? (CBSE 2010, 2012)**

11. **Draw a schematic diagram of a circuit consisting of battery of two cells each of 1.5 V, 50 resistor, 100 resistor and 150 resistor and a plug key, all connected in series. [CBSE (All India) 2009, 2011, 2013]**
12. **What do the following symbols represent in a circuit ? Write the name and one function of each ?**
    [CBSE 2011, 2012, 2013, 2015]

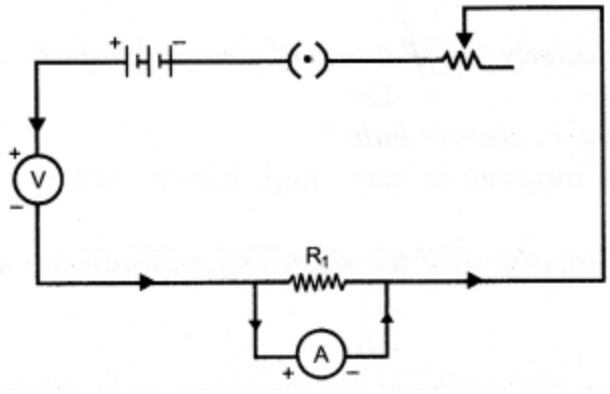


13. **In the circuit diagram shown, the two resistance wires A and B are of same area of cross-section and same material, but A is longer than B. Which ammeter A_1 and A_2 will indicate higher reading of current ? Give reason. (CBSE 2010, 2011)**

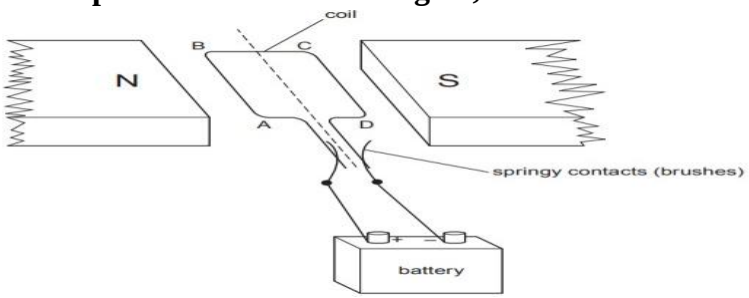


14.

Is the circuit given below correct ? Justify your answer. (CBSE 2014)



15. **A simple motor is made in a school laboratory. A coil of wire is mounted on an axle between the poles of a horseshoe magnet, as illustrated.**



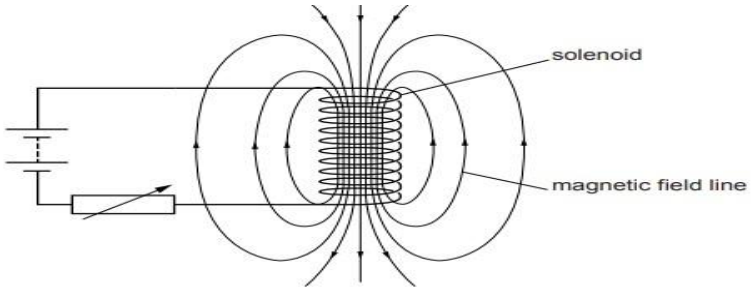
In the example above, coil ABCD is horizontal and the battery is connected as shown.

a. **For this position, state the direction of the force on the arm AB.**

b. **Why does the current in the arm BC not contribute to the turning force on the coil?**

16.

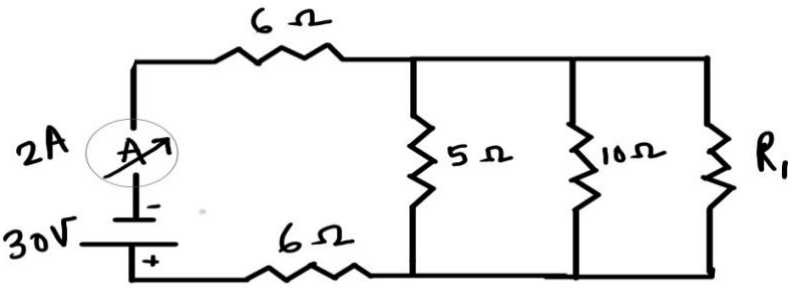
A circuit contains a battery, a variable resistor and a solenoid. The figure below shows the magnetic field pattern produced by the current in the solenoid.



a. **State how the magnetic field pattern indicates regions where the magnetic field is stronger.**

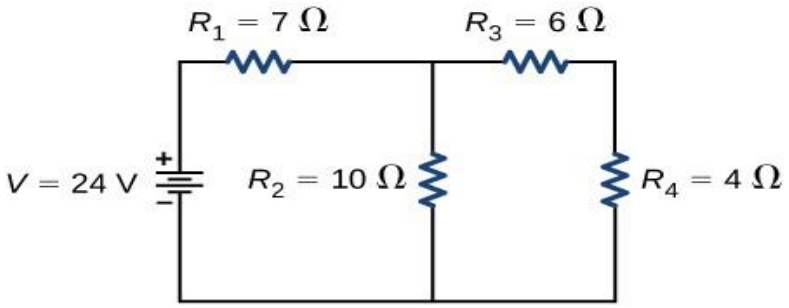
b. **What happens to the magnetic field if the direction of current reverses in The circuit ?**

17.



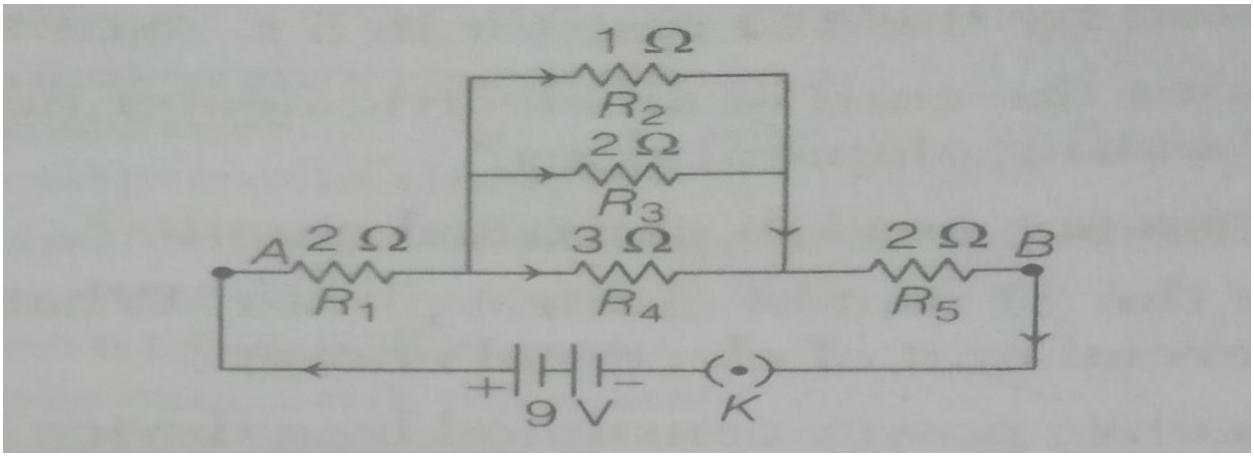
In the above circuit, if the current reading in the ammeter A is 2A, what would be the value of R_1?

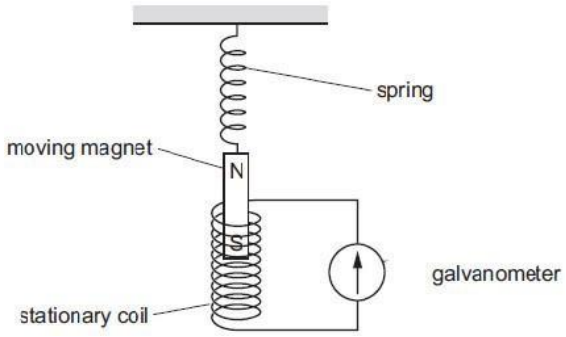
OR



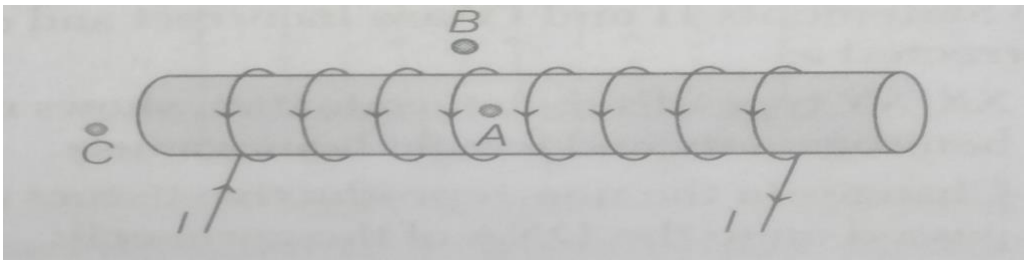
Calculate the total resistance of the circuit and find the total current in the circuit.

18.Find the equivalent resistance of the following circuit.Also, find the current and potential at each resistor .



19.	**Ansari Sir was demonstrating an experiment in his class with the setup as shown in the figure below.**  **A magnet is attached to a spring. The magnet can go in and out of the stationary coil. He lifted the Magnet and released it to make it oscillate through the coil. Based on your understanding of the phenomenon, answer the following questions.** a. **What is the principle which Ansari Sir is trying to demonstrate?** b. **What will be observed when the Magnet starts oscillating through the coil. Explain the reason behind this observation.** c. **Consider the situation where the Magnet goes in and out of the coil. State two changes which could be made to increase the deflection in the galvanometer.** **OR** **Is there any difference in the observations in the galvanometer when the Magnet swings in and then out of the stationary coil? Justify your answer.**

20. For the current carrying solenoid as shown below ,draw magnetic field lines and give reason to explain that out of the three points A, B and C at which point ,the field strength is maximum and at which point it is minimum –



[SECTION – B]

(CHEMISTRY)

1. **Why does graphite conducts electricity, but not diamond?**
2. **State what you will observe when sugar crystals is heated strongly.**
   State what you will observe when sugar crystals is treated with conc. Sulphuric acid?
3. **Draw the possible isomers ? Draw the structures of two isomers of butane, C_4H_{10} .**
   Explain , why we cannot have isomers of first three members of alkane series ?
4. **Draw the possible isomers of the compound with molecular formula C_3H_6O and also give their electron dot structures .**
5. **Why is homologous series of carbon compounds so called ? Write the chemical formula of two consecutive members of any homologous series and state the part of these compounds that determines their (i) physical and (ii) chemical properties .**
6. **State the reason why carbon can neither form C^{4+} captions nor C^{4-} anions ,but forms covalent compound .Also state reasons to explain why covalent compounds :-**
   - **(i) Are bad conductors of electricity ?**
   - **(ii) Have low melting and boiling point ?**
7. **How are the molecules of aldehyde and Ketone structurally different?**
8. **What change has been made in the composition of detergents to make them biodegradable?**

9.Write the name and structure of a saturated compound in which the carbon atoms are arranged in a ring. Give the number of single bonds present in this compound .

10 . Why do alkanes burn with a blue flame?

11 . Which class of carbon compounds is responsible for the depletion of ozone layer at the higher level of the atmosphere? (2012 D)

12. What is an 'esterification' reaction? Describe an activity to show esterification.

13. What are homologous series of carbon compounds? Write the molecular formula of two consecutive members of homologous series of aldehydes. State which part of these compounds determines their:
(i) Physical and
(ii) Chemical Properties.

14. Why are the elements calcium, strontium and barium named as alkaline earths?

15. Element 'Y' with atomic number 3 combines with element 'A' with atomic number 17. What will be the formula of the compound?

16.

1

The table shows the electronic structures of four elements.

Element	Electronic Structure
P	2,6
Q	2,8,1
R	2,8,7
S	2,8,8

a. **Identify which element(s) will form covalent bonds with carbon.**

b. **"Carbon reacts with an element in the above table to form several compounds." Give suitable reason.**

2	**Th** **a.** **diagram below shows part of the periodic table.** **Which elements would react together to form covalent compounds?** **b.** **Between the two elements W and Z, which will have a bigger atomic radius? Why?**  	

17. Element 'Y' with atomic number 3 combines with element 'A' with atomic number 17. What will be the formula of the compound?

18. Elements have been arranged in the following sequence on the basis of their increasing atomic masses.
F, Na, Mg, Al, Si, P, S, Cl, Ar, K
(a) Pick two sets of elements which have similar properties.
(b) The given sequence represents which law of classification of elements? [NCERT Exemplar]

19. An element X belongs to 3rd period and group 16 of the modern periodic table.

(i) Determine the number of Valence electrons and the valency of X .

(ii) Molecular formula of the compound when X reacts with hydrogen and write its electron dot structure .

(iii) Name the element X and state whether it is metallic or non-metallic .

20.Consider the part of periodic table given below and answer the following questions:-

Group → / Period↓	1	2	13	14	15	16	17	18
1	*a*							*j*
2	*b*	*e*				*g*	*h*	*k*
3	*c*			*f*			*i*	*l*
4	*d*							

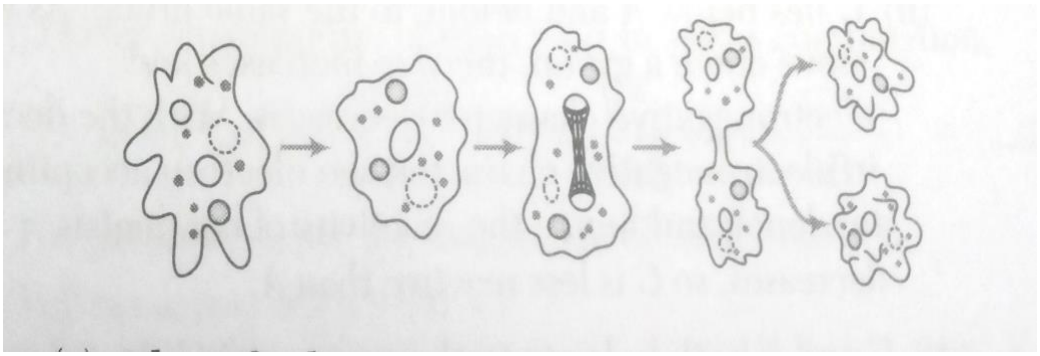
(i) **The atom of which element is smaller in size e or h ?**
(ii) **Which element is the most electropositive in nature ?**
(iii) **Which element has only one proton in its atom ?**
(iv) **What is the valency of g ?**
(v) **How many Valence electrons does g have ?**
(vi) **Name the element which is a metalloid .**

[Section – C]

(BIOLOGY)

1. **"Males are heterogametic ." Explain this statement .**
2. **It is the responsibility of the government to arrange for the management and disposal of waste .As an individual you have no role to play . Do you agree ? Support your answers with two reasons.**
3. **" The chromosome number of the sexually reproducing parents and their offspring is the same ." Justify this statement.**
4. **Define all the events in correct sequence that lead to pregnancy in a female .**
5. **What is meant by the word Contraception ? Discuss the types of surgical method of contraception .**
6. **Salman wants to volunteer for Swachh Bharat Abhiyan internship .He got a responsibility to device various methods for garbage management. Help him to write various ways to control and manage garbage .**
7. **(i) Why should biodegradable and non-biodegradable wastes be discarded in two separate dustbins ?**
   (ii) Why do we exemplify crop fields as artificial ecosystem ?

8. **Study the diagram given below :-**



   (a) **Identify the process .**
   (b) **Which organisms use the above method for reproduction ?**
   (c) **How is the above method different from the process of fragmentation ?**

9. **Differentiate between monohybrid and dihybrid crosses with the help of an example.**
10. **Explain the term "Regeneration" as used in relation to reproduction of organisms . Describe briefly how regeneration is carried out in multicellular organisms like HYDRA ?**
11. **Differentiate between pollen tube and style .**
12. **Give any three points of differentiation between acquired and inherited characters with one example each.**
13. **A plant is heterozygous for a pair of alleles. This plant is self-pollinated and the resulting seeds are germinated and allow to grow.**
    Write the ratios of phenotypes and genotypes of expected offsprings .

14. **What harmful effects do agricultural practices have on the environment ?**
15. **(i) State any three characteristics of sexual reproduction .**
    (ii) Explain what happens to the egg once it gets fertilised in human female .

16. **What is meant by pollination ? Differentiate between the two modes of pollination in flowering plants .**
17. **What is meant by non- biodegradable waste ? Why is the government stressing more on the use of jute/paper bags instead of plastic bags ?**
18. **After self-pollination in pea plants with round, yellow seeds, following types of seeds were obtained by Mendel :-**

Seeds	Numbers
Round, yellow	630
Round, green	216
Wrinkled, yellow	202
Wrinkled, green	64

Analyse the result and describe the mechanism of inheritance which explains these results . (CBSE 2020)

19. **"In humans, there is a 50% probability of the birth of a boy and 50% probability that a girl will be born ."Justify the statement on the basis of the mechanism of sex-determination in human beings . (CBSE 2020)**
20. **What do you understand by Mendel's dihybrid cross ? When pea plants having round and yellow seeds were crossed with plants having wrinkled and green seeds and then all the plants of F_1 -generation had round and yellow seeds. Find out the phenotypic ratio of F_2 -generation .**