

## SAMPLE PAPER 5 (2017-18)

**SUBJECT: SCIENCE**

**CLASS : X**

**MAX. MARKS : 80**

**DURATION : 3 HRS**

---

### General Instructions:

1. All questions are compulsory.
  2. The question paper comprises of **two Sections, A and B**. You are to attempt both the sections.
  3. All questions of **Section-A** and **Section-B** are to be attempted separately.
  4. There is an internal choice in three questions of three marks each, two question of five marks and one question of Practical Based Question.
  5. Question number **1 to 2** in **Section-A** are **one mark** question. These are to be answered in **one word** or in **one sentence**.
  6. Question numbers **3 to 5** in **Section-A** are **two marks** questions. These are to be answered in about **30 words** each.
  7. Question numbers **6 to 15** in **Section-A** are **three marks** questions. These are to be answered in about **50 words** each.
  8. Question numbers **16 to 21** in **Section-A** are **five marks** questions. These are to be answered in about **70 words** each.
  9. Question numbers **22 to 27** in **Section-B** are questions based on practical skills and are **two marks** questions.
- 

### SECTION – A

1. Name the method by which *Spirogyra* reproduces under favourable conditions. Is this method sexual or asexual?
2. Why do mammals require more extensive respiratory surface?
3. An object is placed at a distance of 30 cm from a concave lens of focal length 15 cm. List four characteristics (nature, position, etc.) of the image formed by the lens.
4. Describe how hydro-energy can be converted into electrical energy. Write two limitations of hydro-energy.
5. An element 'M' has atomic number 12.
  - (a) Write its electronic configuration.
  - (b) State the group to which 'M' belongs.
  - (c) Is 'M' a metal or a non-metal?
  - (d) Write the formula of its oxide.
6.
  - (a) Mention effect of electric current on which the working of an electrical fuse is based.
  - (b) Draw a schematic labelled diagram of a domestic circuit which has a provision of a main fuse, meter, one light bulb and a socket.

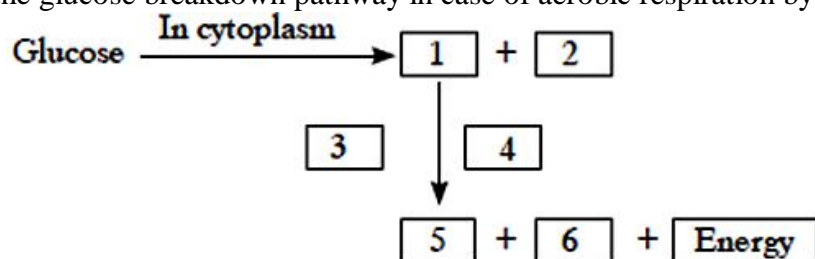
**OR**

- (a) Explain the term overloading of an electric circuit.
  - (b) Cable of a microwave oven has three wires inside it which have insulation of different colours black, green and red. Mention the significance of the three colours and potential difference between red and black one.
7. Two resistors  $3\ \Omega$  and unknown resistor are connected in a series across a 12 V battery. If the voltage drop across the unknown resistor is 6 V, find (a) potential across  $3\ \Omega$  resistance (b) the current through unknown resistor 'R' (c) equivalent resistance of the circuit.

8. (a) Define a balanced chemical equation. Why should an equation be balanced?  
 (b) Write the balanced chemical equation for the following reaction:  
 (i) phosphorus burns in presence of chlorine to form phosphorus pentachloride.  
 (ii) burning of natural gas.  
 (iii) the process of respiration.
9. Write the number of periods and groups in the Modern Periodic Table. How does the metallic character of elements vary on moving (i) from left to right in a period, and (ii) down a group? Give reason to justify your answer.
10. (a) Draw a diagram to show open stomatal pore and label on it: (i) guard cells (ii) chloroplast  
 (b) State two functions of stomata.

**OR**

- (a) Complete the glucose breakdown pathway in case of aerobic respiration by filling the blanks.



- (b) Name the molecule in the cell which stores the energy produced at the end of the pathway.

11. How did Mendel explain that it is possible that a trait is inherited but not expressed in an organism?
12. "Evolution and classification of organisms are interlinked." Give reasons to justify this statement.
13. (a) Define the following terms in the context of spherical mirrors : (i) Pole (ii) Centre of curvature (iii) Radius of curvature (iv) Principal axis  
 (b) Draw ray diagrams to show the principal focus of (i) a concave mirror, and (ii) a convex mirror.
14. (a) Mention the pH range within which our body works. Explain how antacids give relief from acidity. Write the name of one such antacid.  
 (b) Fresh milk has a pH of 6. How does the pH will change as it turns to curd? Explain your answer.  
 (c) A milkman adds a very small amount of baking soda to fresh milk. Why does this milk take a longer time to set as curd?

**OR**

- (a) Explain why is hydrochloric acid a strong acid and acetic acid, a weak acid. How can it be verified?  
 (b) Explain why aqueous solution of an acid conducts electricity.
15. What is contraception? Name any two methods. How does the use of these methods have a direct effect on the health and prosperity of a family? State any three points.

16. (a) What is a solenoid? Draw a sketch of the pattern of field lines of the magnetic field through and around a current carrying solenoid.  
(b) Consider a circular loop of a wire lying in the plane of the table. Let the current pass through the loop clockwise. Apply the right hand rule to find out the direction of the magnetic field inside and outside the loop.
17. (a) Draw the structure of a neuron and label the following on it: Nucleus, Dendrite, Cell body and Axon  
(b) Name the part of neuron:  
(i) where information is acquired.  
(ii) through which information travels as an electrical impulse.
18. (a) In the formation of compound between two atoms A and B, A loses two electrons and B gains one electron.  
(i) What is the nature of bond between A and B ?  
(ii) Suggest the formula of the compound formed between A and B.  
(b) On similar lines explain the formation of  $MgCl_2$  molecule.  
(c) Common salt conducts electricity only in the molten state. Why ?  
(d) Why is melting point of NaCl high ?
19. Why are certain compounds called hydrocarbons? Write the general formula for homologous series of alkanes, alkenes and alkynes and also draw the structure of the first member of each series. Write the name of the reaction that converts alkenes into alkanes and also write a chemical equation to show the necessary conditions for the reaction to occur.

**OR**

What are esters? How are esters prepared? Write the chemical equation for the reaction involved. What happens when an ester reacts with sodium hydroxide? Write the chemical equation for the reaction and also state the name and use of this reaction.

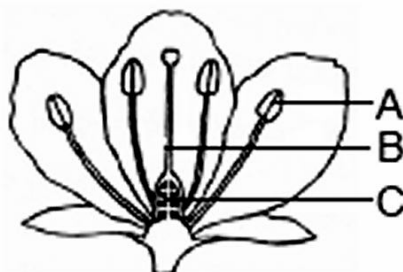
20. A student suffering from myopia is not able to see distinctly the objects placed beyond 5 m. List two possible reasons due to which this defect of vision may have arisen.  
(a) With the help of ray diagrams, explain  
(i) why the student is unable to see distinctly the objects placed beyond 5 m from his eyes.  
(ii) the type of the corrective lens used to restore proper vision and how this defect is corrected by the use of this lens.  
(b) If, in this case, the numerical value of the focal length of the corrective lens is 5 m, find the power of the lens as per the new Cartesian sign convention.
21. (a) What is 'environmental pollution'?  
(b) Distinguish between biodegradable and non-biodegradable pollutants.  
(c) State two problems caused by the non-biodegradable waste that we generate in our daily life.  
(d) Choose the biodegradable pollutants from the list : Sewage, DDT, radioactive waste, agricultural waste.

**OR**

What is water harvesting? Explain the traditional water harvesting system with a suitable diagram. Write about the techniques of water harvesting.

## SECTION – B

22. What do you observe when you drop a few drops of acetic acid to test tubes containing (a) phenolphthalein (b) distilled water (c) universal indicator (d) sodium hydrogen carbonate powder
23. What are isomers? Draw the structures of two isomers of butane,  $C_4H_{10}$ .
24. Name the parts A, B and C shown in the following diagram and state one function of each.



25. When a student observes a temporary mount of leaf peel under a microscope, he observes two different types of cells in leaf peel. Name these two different types of cells. On what basis can a student differentiate between these two cells.
26. If the image formed by a lens for all positions of an object placed in front of it is always erect and diminished, what is the nature of this lens? Draw a ray diagram to justify your answer. If the numerical value of the power of this lens is 10 D, what is its focal length in the Cartesian system?
27. In an experiment to study the relation between the potential difference across a resistor and the current through it, a student recorded the following observations:

Potential difference V (volts)	1.0	2.2	3.0	4.0	6.4
Current I (amperes)	0.1	0.2	0.6	0.4	0.6

On examine the above observations, the teacher asked the student to reject one set of readings as the values were out of agreement 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.

**OR**

Draw an electric circuit to describe Ohm's law. Label the circuit components used to measure electric current and potential difference.