

**CLASS X (2019-20)**  
**SCIENCE (CODE 086)**  
**SAMPLE PAPER-18**

**Time : 3 Hours**

**Maximum Marks : 80**

**General Instructions :**

- (i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
- (ii) All questions are compulsory.
- (iii) Internal choice is given in each sections.
- (iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
- (v) All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.
- (vi) All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.
- (vii) This question paper consists of a total of 30 questions.

**SECTION A**

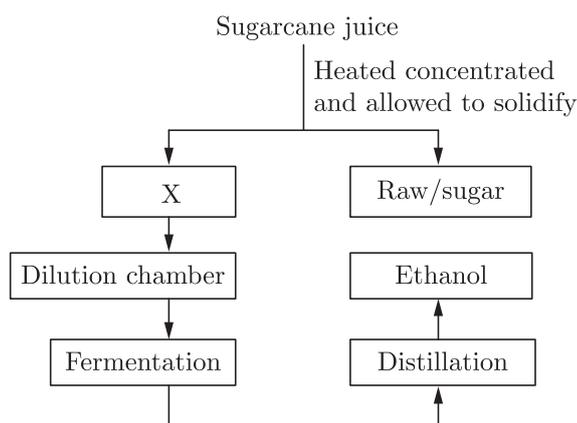
Q1. Identify the oxidising agent and the substance oxidised in the following reaction. [1]  
 $\text{CuO} + \text{H}_2 \longrightarrow \text{Cu} + \text{H}_2\text{O}$

Q2. Why is sodium kept immersed in kerosene oil? [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**

Ethanol or ethyl alcohol is an important organic compound. Its formula is written as  $\text{C}_2\text{H}_5\text{OH}$  or  $\text{CH}_3\text{CH}_2\text{OH}$ . It is used in industries, hospitals and homes. Ethanol is manufactured by the fermentation of raw materials such as molasses, sugar and starch.

A flow chart for the production of ethanol from molasses is given below.



3.1 Read the flow chart given above, and identify X. [1]

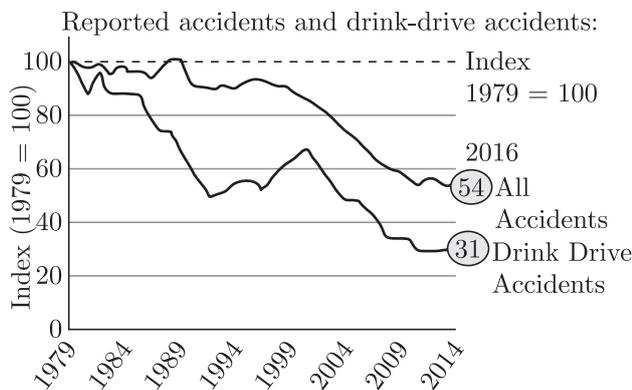
3.2 Which of the following statements correctly defines fermentation? [1]

- (a) breakdown of sugar into an alcohol or acid in the absence of oxygen.
- (b) breakdown of sugar into carbon dioxide and water.
- (c) breakdown of glucose into lactic acid in the presence of oxygen.
- (d) breakdown of glucose into lactic acid and oxygen.

**3.3** Ethanol can be produced from ethene ( $H_2C = CH_2$ ), then why is it manufactured from molasses or starch? [1]

- (a) Ethene is not easily available.
- (b) To save non-renewable petroleum products.
- (c) The quality of ethanol produced from molasses is better.
- (d) Ethene is an unsaturated hydrocarbon.

**3.4** Based on the data represented in the graph below, what is the reason for the maximum number of deaths while driving after consuming alcohol? [1]



**Q4.** Question numbers 4.1-4.4 are based on two illustrations and the related studied concepts. Analyse them and answer the questions that follow.

City Level Prevalence of Child Health Outcomes

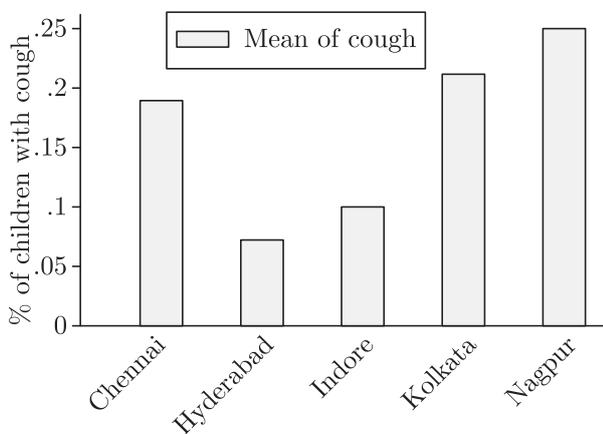


Table: Effect of air pollution in early life of a man

Stage : Age :	N e w born 0-2 mos	I n f a n t / Toddler 2 mons-2 yrs	Young child 2-6 yrs	School-Age Child 6-12 yrs	Adolescent 12-18 yrs
Lung development :	Alveolar development				

	High respiratory rate				
			Increasing lung volume		
Air pollution risks :	Respiratory death				
			Chronic cough and bronchitis		
			Reduced lung function		
		Respiratory symptoms and illnesses	Wheezing and asthma attacks		
			Respiratory-related school absences		

Air pollution exposure has also been more recently linked to respiratory symptoms and illnesses in early life including cough, bronchitis, wheeze and ear infections

- 4.1 Which city has the maximum number of children with ill health? [1]  
 4.2 Why do fewer number of children suffer with cough in Hyderabad city? [1]  
 4.3 List the main pollutants responsible for causing severe health problems in children. [1]  
 4.4 Write any two respiratory illnesses in adolescent that are caused by air pollution. [1]

- Q5. Consider the following statements with regard to periodic classification of elements. [1]  
 A. In Modern Periodic Table, the isotopes of an element having different mass numbers are put at one place in the same group.  
 B. Elements in Mendeleev's Periodic Table are arranged on the basis of increasing atomic numbers.  
 C. Elements in the Modern Periodic Table are arranged on the basis of increasing mass numbers.  
 D. In the Modern Periodic Table, nickel of a lower mass number is kept after cobalt of a higher mass number.

The correct statements are

- (a) A and B (b) B and C  
 (c) C and D (d) A and D

**OR**

Which of the following element is not the member of second period? [1]

- (a) Li (b) Ca  
 (c) F (d) C

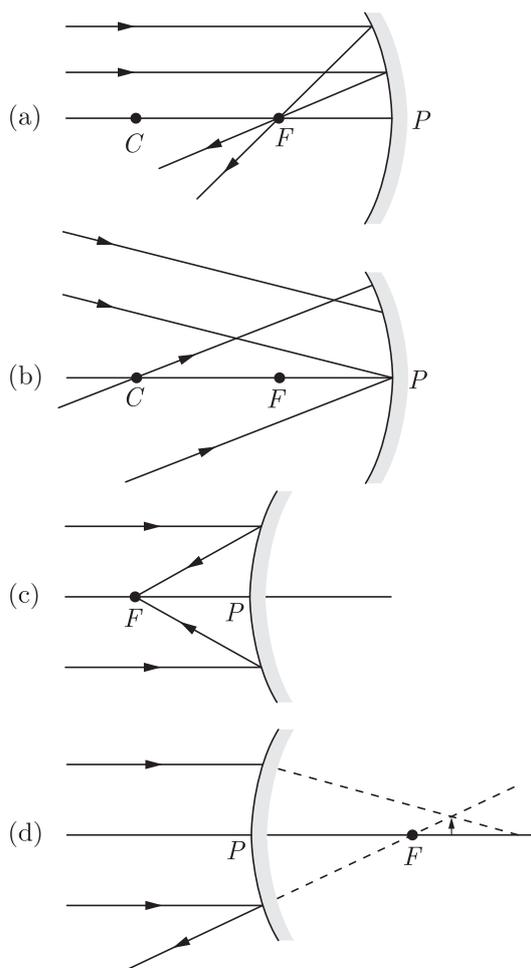
- Q6. In human beings, 23 pair of chromosomes are present in each cell. The number of chromosomes in each sex cell of a human being (male or female) is most likely to be [1]  
 (a) 23 (b) 22  
 (c) 21 (d) 44

**OR**

Two pea plants one with round green seeds (RRyy) and another with wrinkled yellow (rrYY) seeds produce  $F_1$  progeny that have round, yellow (RrYy) seeds. When  $F_1$  plants are selfed, the  $F_2$  progeny will have new combination of characters. Choose the new combination from the following

- i. Round, yellow  
 ii. Round, green  
 iii. Wrinkled, yellow  
 iv. Wrinkled, green  
 (a) (i) and (ii) (b) (i) and (iv)  
 (c) (ii) and (iii) (d) (i) and (iii)en.

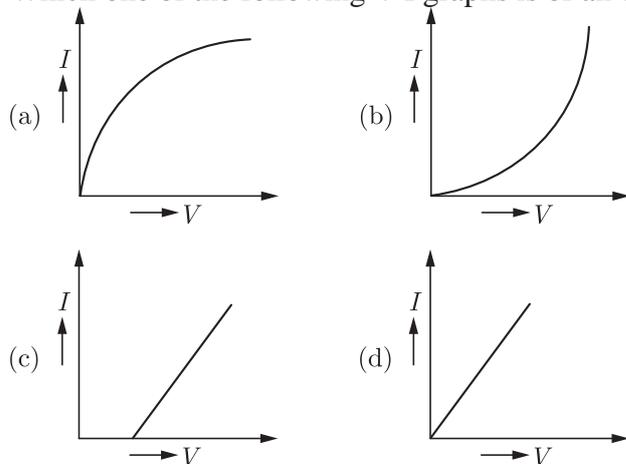
Q7. Which of the following ray diagrams depicts correctly the path of a parallel beam of light after reflection from a spherical mirror? 1



Q8. When lead nitrate reacts with potassium iodide, a yellow precipitate is formed. This yellow compound formed is [1]

- (a)  $Pb(NO_3)_2$  (b)  $KNO_3$   
 (c)  $PbI_2$  (d)  $PbO$

Q9. Which one of the following V-I graphs is of an ohmic conductor? [1]



Q10. Read the following statements regarding the construction of check dams across the flooded gullies.

- A. Check dams hold water for irrigation.  
 B. Check dams recharge groundwater.  
 C. Check dams hold water and increase soil erosion.

D. Check dams hold water permanently.

The correct statement(s) is/are

[1]

- (a) only A (b) only B  
(c) only B and C (d) A, B and C

Q11. When ethanoic acid is added to sodium hydrogen-carbonate, a gas evolves. Which of the following statements is correct about the evolved gas? [1]

- A. It has a pungent smell.  
B. It turns lime water milky.  
C. It extinguishes a burning splinter.  
D. It dissolves in a solution of sodium hydroxide.  
(a) A, B and C (b) B, C and D  
(c) B and C only (d) B and D only

Q12. Magnification produced by a rear view mirror fitted in vehicles [1]

- (a) is less than one.  
(b) is more than one.  
(c) is equal to one.  
(d) can be more than or less than one depending upon the position of the object.

**OR**

A plane mirror is moving towards you with a speed of 1 m/s. The speed with which your image is approaching you is [1]

- (a) 2 m/s (b) 1 m/s  
(c) 4 m/s (d) 8 m/s

**For question numbers 13 and 14, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.**

- (a) Both A and R are true and R is correct explanation of the assertion.  
(b) Both A and R are true but R is not the correct explanation of the assertion.  
(c) A is true but R is false.  
(d) A is false but R is true.

Q13. **Assertion :** Dentists use concave mirrors to observe the magnified images of the patient's teeth.  
**Reason :** A concave mirror produces a real and magnified image of the object placed between its pole and focus. [1]

Q14. **Assertion :** Wires used in heater elements should have high resistivity and a high melting point.  
**Reason :** Heater wires are made of an alloy having resistivity higher than that of its constituent metals. [1]

## SECTION B

Q15. Write a balanced chemical equation with the symbols for the following reactions:  
(a) Solutions of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride.  
(b) Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water. [3]

Q16. (a) What is a hydrated salt?  
(b) Give two examples of hydrated salt which are white and state their chemical formula. [3]

Q17. Write the main aim of classifying elements. Which basic property of the elements is used in the development of Modern Periodic Table? State the Modern Periodic Law. On which side of this periodic table may we find the metals, non-metals and the metalloids? [3]

**OR**

An element X is placed in the thirteenth group and third period of the Modern Periodic Table. Answer the following questions stating the reason in each case.

(a) Write the electronic configuration of X.

(b) Write the formula of the compound formed when the element X reacts with another element Y of atomic number 17.

(c) Will the oxide of the element X be acidic or basic? [3]

Q18. List four characteristics of plant hormones. Name any two plant hormones. [3]

Q19. (a) Draw the structure of neuron and label cell body and axon.

(b) Name the part of neuron

(i) where information is acquired;

(ii) through which information travels as an electrical impulse. [3]

Q20. Mendel, in one of his experiments with pea plants, crossed a variety of pea plant having round seeds with one having wrinkled seeds. Write Mendel's observations giving reasons of  $F_1$  and  $F_2$  progeny of this cross. State any two contrasting characters, other than roundness of pea plants, that Mendel used in his experiments. [3]

**OR**

Explain how sexually reproducing organisms maintain a constant chromosome number through several generations. [3]

Q21. What is atmospheric refraction of light? Draw a labelled diagram to explain the reason why the stars appear higher than their actual positions, when viewed near the horizon. [3]

**OR**

A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like kerosene or turpentine oil? Support your answer with reason.

Q22. Name and state the rule to determine the direction of the

(a) force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it.

(b) magnetic field produced around a straight current-carrying conductor.

(c) current induced in a coil due to its rotation in a magnetic field. [3]

Q23. Draw a labelled diagram of an electric motor and state the principle of its working. [3]

Q24. Explain how the ocean thermal energy can be harnessed. Mention any two limitations in obtaining energy from the ocean. [3]

## SECTION C

Q25. Name an ionic compound and write its formula. Explain the formation of this compound by drawing electronic structures of the metal and non-metal involved. List four properties of ionic compound. [5]

Q26. (a) What is esterification? Give one chemical equation.

- (b) What happens when an ester is treated with sodium hydroxide solution? State the name of this reaction. [5]
- (c) Differentiate between the addition reaction and substitution reaction shown by hydrocarbons.

**OR**

You are given balls and stick model of six carbon atoms and fourteen hydrogen atoms and sufficient number of sticks. In how many ways one can join the models of six carbon atoms and fourteen hydrogen atoms to form different molecules of  $C_6H_{14}$ .

- Q27. Write in tabular form the functions of the following digestive glands in the human body. Also state the name and function of the substances secreted.
- (i) salivary glands, (ii) gastric glands, (iii) liver  
(iv) pancreas and (v) intestinal glands [5]

**OR**

List the events that occur during the process of photosynthesis.

- Q28. (a) What is DNA copying? State its importance in the reproduction of sexually reproducing organisms.  
(b) Distinguish between a gamete and zygote. Explain their roles in sexual reproduction. [5]
- Q29. (a) One half of a concave mirror of radius of curvature 20 cm is covered with a black paper. A candle flame is placed in front of the mirror at a distance of 15 cm. Will the mirror produce a complete image of the flame on the screen? Draw ray diagram to justify your answer.  
(b) An object is placed in front of a concave mirror of focal length 12 cm. The distance of the object from the mirror is 18 cm. Calculate the distance of the image from the mirror and its magnification. [5]

**OR**

- (a) What is meant by power of a lens? Define its SI unit.  
(b) You have two lenses of focal length +20 cm and -20 cm. Write the nature of each lens. Which of the two lenses can form a virtual and magnified image of an object placed 15 cm from the lens? Draw a ray diagram to justify your answer. [5]
- Q30. State Ohm's Law. With the help of a labelled circuit diagram explain the method of its experimental verification. Draw V-I graph and describe the method of determining the resistance of a resistor using this graph. [5]

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