SAMPLE PAPER 5

Class 10 - Science

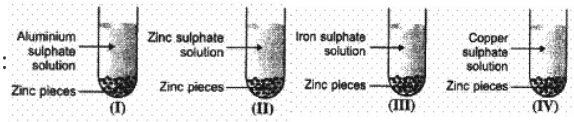
Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective-type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

1. Zinc pieces were placed in each of the four test tubes containing different salt solutions as shown below **[1]**



A colour change would be observed in solutions:

a) II and IV b) III and IV

c) II and III d) I and IV

2. The drying agent used for ammonia gas is **[1]**

a) P_2O_5 b) Slaked lime

c) Quick lime d) Conc. H_2SO_4

3. Four solutions P, Q, R and S have PH 2, 7, 9 and 13, respectively. Which of the solution will turn phenolphthalein pink? **[1]**

a) R and S b) S only

c) Q and S d) P only

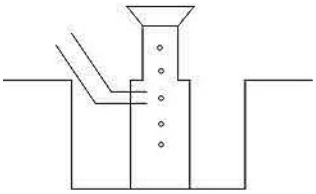
4. If the pH of a solution is 13, it means that it is **[1]**

a) Weakly acidic b) Strongly Basic

c) Strongly acidic

d) Weakly basic

5. A metal is heated with dil H_2SO_4. The gas evolved is collected by the method shown in the figure. Answer the following questions based on it: **[1]**



The gas _____ than air and it is _____ in water.

a) heavier, insoluble

b) lighter, soluble

c) heavier, soluble

d) lighter, insoluble

6. A basic lining is given to a furnace by using: **[1]**

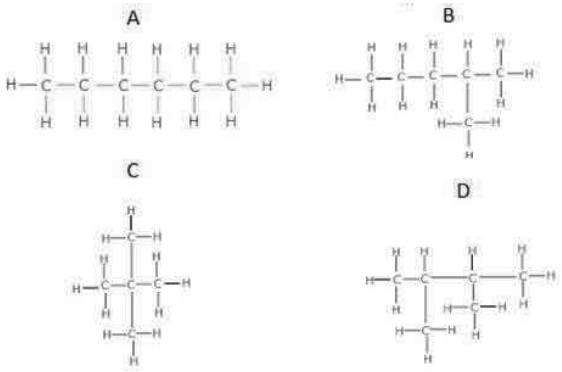
a) Silica

b) Haematite

c) Calcined dolomite

d) Copper sulphate

7. Which of the following represent the formula C_6H_{14}? **[1]**



a) A, B and D

b) A and C

c) All of these

d) A and B

8. The inner lining of stomach is protected by one of the following from hydrochloric acid. Choose the correct one **[1]**

a) Salivary amylase

b) Pepsin

c) Mucus

d) Bile

9. The hormone secreted by the thyroid gland is **[1]**

A. Thyroxin

B. Calcitonin

C. Adrenaline

D. Insulin

a) B and C

b) A and B

c) A, B and D

d) All of these

10. The ability of a cell to divide into several cells during reproduction in Plasmodium is called **[1]**

a) multiple fission

b) budding

c) binary fission

d) reduction division

11. A cross between hybrid and a parent is known as **[1]**

a) Back cross
b) Test cross
c) Monohybrid cross
d) Reciprocal cross

12. To show experimentally that CO_2 is given out during respiration, student must use **[1]**

a) KOH solution
b) C_2H_5OH
c) $Ca(OH)_2$ solution
d) $Al(OH)_3$ solution

13. The refractive index of water with respect to air is $\frac{4}{3}$. The refractive index of air with respect to water will be: **[1]**

a) 0.50
b) 0.75
c) 0.25
d) 1.75

14. What is the spectrum? **[1]**

a) None of these
b) The band of 5 colours.
c) The band of 6 colours.
d) The band of 7 colours.

15. An example of a man-made ecosystem is: **[1]**

a) Grassland
b) River
c) Desert
d) Garden

16. Secondary treatment in sewage treatment plant involves: **[1]**

a) Chemical treatment
b) Physical treatment like sedimentation
c) Passing ultraviolet radiations
d) Biological treatment

17. **Assertion (A):** Paint is applied on the iron articles. **[1]**
Reason (R): To protect them from rain.

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

18. **Assertion (A):** Individuals produced by asexual reproduction are known as clones. **[1]**
Reason (R): They are known as clones because they are genetically identical.

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

19. **Assertion (A):** The strength of the magnetic field produced at the centre of a current-carrying circular coil increases on increasing the current flowing through the coil. **[1]**
Reason (R): Magnetic field strength is inversely proportional to the current flowing in the coil.

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

20. **Assertion (A):** Decomposers act as cleaning agents of the environment. **[1]**
Reason (R): The decomposers recycle waste material in the hydrosphere.

a) Both A and R are true and R is the correct
b) Both A and R are true but R is not the

explanation of A. correct explanation of A.

c) A is true but R is false. d) A is false but R is true.

Section B

21. When a drop of orange juice is added to pure water, how the pH value will vary for water? If a drop of lemon juice is also added, will there be any more change in the pH value? **[2]**

22. Name the reproductive parts of an angiosperm. Where are these parts located? Explain the structure of its male reproductive part. **[2]**

23. Write the functions of large intestine. **[2]**

OR

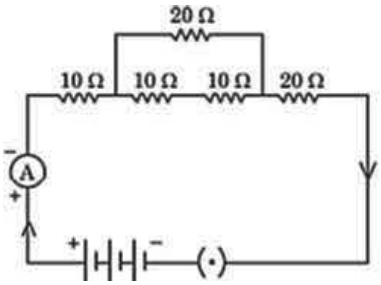
List two types of the transport system in human beings and write the functions of any one of these.

24. What is the cause of refraction of light when it passes from one medium to another? **[2]**

25. Why does a compass needle show deflection when brought near a bar magnet? **[2]**

OR

Calculate the equivalent resistance of the following electric circuit:



26. Using the following information form a pathway showing the formation of ozone at higher levels. And also include information that is not mentioned below to complete it. **[2]**

Ozone, UV, Molecular oxygen.

Section C

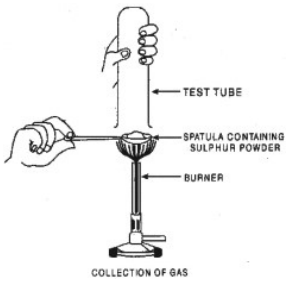
27. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in figure below. **[3]**

a. What will be the action of gas on

i. dry litmus paper?

ii. moist litmus paper?

b. Write a balanced chemical equation for the reaction taking place.



28. A non-metal A which is the largest constituent of air, when heated with H_2 in 1:3 ratio in the presence of a catalyst (Fe) gives a gas B. On heating with O_2, it gives an oxide C. If this oxide is passed into the water in the presence of air it gives an acid D which acts as a strong oxidizing agent. **[3]**

a. Identify A, B, C, and D

b. To which group of periodic table does this non-metal belong?

OR

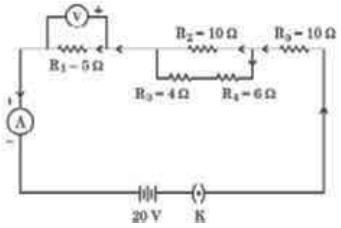
What are the various methods used for concentration of ore/Ore dressing?

29. What are the different ways in which glucose is oxidised to provide energy in various organisms? **[3]**

30. A man with blood group A married a person with blood group O. Their daughter has blood group O. Is this information enough to tell you which of the blood group trait A or O is dominant. Why or why not? **[3]**

31. Sudha finds out that the sharp image of window pane of her science laboratory is formed at a distance of 15 cm from the lens. She now tries to focus the building visible of her outside the window instead of the window pane without disturbing the lens. In which direction will she move the screen to obtain a sharp image of the building? What is the approximate focal length of this lens? **[3]**

32. Study the following circuit and find: **[3]**



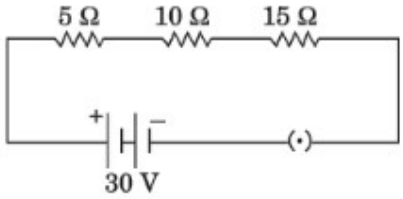
i. Effective resistance of the circuit

ii. Current drawn from the battery

iii. Potential difference across the 5Ω resistor

33. a. How will you infer with the help of an experiment that the same current flows through every part of a circuit containing three resistors in series connected to a battery? **[3]**

b. Consider the given circuit and find the current flowing in the circuit and potential difference across the 15 Ω resistors when the circuit is closed.



Section D

34. A compound C (molecular formula, $C_2H_4O_2$) reacts with Na - metal to form a compound R and evolves a gas that burns with a pop sound. Compound C on treatment with an alcohol A in presence of an acid forms a sweet-smelling compound S (molecular formula, $C_3H_6O_2$). On the addition of NaOH to C, it also gives R and water. S on treatment with NaOH solution gives back R and A. **[5]**

Identify C, R, A, S, and write down the reactions involved.

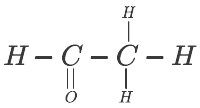
OR

i. Compare soaps and detergents on the basis of their composition and cleansing action in hard water.

ii. What happens when ethanol is treated with sodium metal? State the behaviour of ethanol in this reaction.

iii. Draw the structure of cyclohexane.

iv. Name the following compound.



35. Name the following: **[5]**

i. The body part in which the testes are present in a human male.

ii. The part from where the sperms are released out of the body.

iii. The part of the female reproductive system containing a mature egg.

iv. The accessory fluid in human males, whose secretion activates the sperms.

v. The period of adolescence when the reproductive tissues begin to mature.

OR

a. Why is the use of iodised salt advisable? Name the disease caused due to deficiency of iodine in our diet and state its one symptom.

b. How do nerve impulses travel in the body? Explain.

36. Why does electric current start flowing in a circuit the moment circuit is complete? When do we say that the potential difference across a conductor in a circuit is 1 volt? Calculate the potential difference between the two terminals of a battery if 12 joules of work is done in transferring 2 coulombs of charge. **[5]**

OR

a. Write the relation between resistance and electrical resistivity of the material of a conductor in the shape of a cylinder of length **l** and area of cross-section **A**. Hence derive the S.I. unit of electrical resistivity.

b. The resistance of a metal wire of length 5 m is 100 Ω. If the area of cross-section of the wire is 3×10^{-7} m^2, calculate the resistivity of the metal.

Section E

37. **Read the text carefully and answer the questions:** **[4]**

A series of organic compounds having the same functional group, with similar or almost identical chemical characteristics in which all the members can be represented by the same general formula and the two consecutive members of the series differ by —CH_2, group or 14 mass unit in their molecular formulae is called a homologous series. For example, all the members of the alcohol family can be represented by the general formula, $C_nH_{2n+1}OH$ where, n may have the values 1, 2, 3, ... etc. The various members of a particular homologous series are called homologues. The physical properties such as density, melting point, boiling point, solubility, etc. of the members of a homologous series show almost regular variation in ascending or descending the series.

(i) Write two characteristics of homologous series.

(ii) What are the fourth and fifth members of the alcohol homologous series? Write their name with the formula.

OR

Draw structure of Butanol.

38. **Read the text carefully and answer the questions:** **[4]**

A purebred pea plant with smooth seeds (dominated characteristic) was crossed with a purebred pea plant with wrinkled seeds (recessive characteristic). The F_1 generation was self-pollinated to give rise to the F_2 generation.

(i) What will be the genotypic ratio of the given F_2 generation?

(ii) What is the expected observation of the F_2 generation of plants?

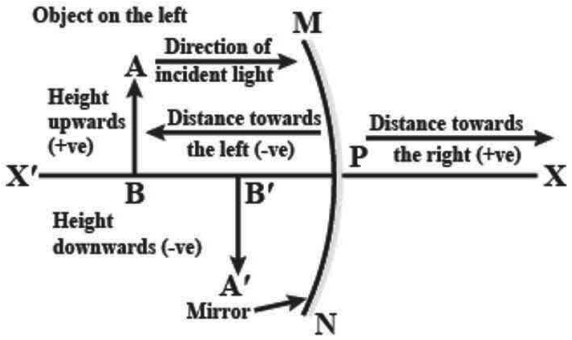
(iii) If a genotype consists of different types of alleles, what is it called?

OR

What is the alternative form of the gene?

39. **Read the text carefully and answer the questions:** **[4]**

While dealing with the reflection of light by spherical mirror set of sign convention is followed. In this convention, the pole (P) of the mirror is taken as the origin. The object is placed to the left of the mirror. All distance measured to the right of the origin is taken positively. Distance to the left is measured negative. All distance parallel to the principle is measured from the pole.



(i) Linear magnification produced by a concave mirror may be

a) less than 1, more than 1 or equal to 1 b) more than 1 or equal to 1

c) less than 1 or equal to 1 d) less than 1 or more than 1

(ii) Magnification produced by a plane mirror

a) zero b) equal to one

c) less than one d) greater than one

(iii) If the magnification of -1 is to be obtained by using a converging mirror, then the object has to be placed

a) beyond the centre of curvature b) at infinity

c) between pole and focus d) at the centre of curvature

OR

If the magnification has a plus sign then the image is _____ and _____.

a) real, erect b) virtual, inverted

c) virtual, erect d) real, inverted