Soham Tangirala
S2-C

GYAN BHARATI SCHOOL

Second Terminal Examination (2024-25)
Subject: Science (086)
Class: S2

Time: 3 Hours **MM: 80**

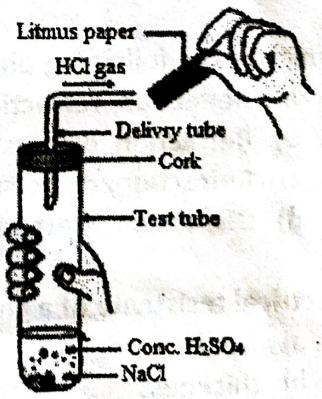
General Instructions:

- **This question paper consists of 7 pages and 39 questions.**
- **All questions are compulsory.**
- **Section A consists of 20 objective type questions carrying 1 mark each.**
- **Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.**
- **Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.**
- **Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.**
- **Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.**

Section A

1. **A student adds lead and silver to two different test tubes containing an equal amount of copper sulphate solution. The student observes that the colour of the solution in the test tube with lead changes. What explains the change in the colour of the solution?** **1**
   a) **A displacement reaction takes place as lead replaces copper from the solution.**
   b) **A combination reaction takes place as lead combines with sulphate in the solution.**
   c) **A decomposition reaction takes place as copper dissociates from sulphate in the solution.**
   d) **A double displacement reaction takes place as copper dissociates from sulphate and lead combines with sulphate in the solution.**

2. **The figure given below represents the experiment carried out between conc. Sulphuric acid and sodium chloride, which react with each other to form HCl gas.** **1**
   When blue litmus paper is brought near the mouth of the delivery tube to check the presence of HCl acid, no change is observed in the colour of litmus paper because:
   a) **Blue litmus paper does not change its color with an acid.**
   b) **The litmus paper used is moist.**
   c) **The litmus paper used is dry.**
   d) **The litmus paper is kept very close to the mouth of the delivery tube.**



3. **Farmers neutralise the effect of Acidity on the soil by adding:** **1**
   a) **Slaked lime**
   b) **Gypsum**
   c) **Caustic soda**
   d) **Baking soda**

4. Four students of class X were asked to study the effect of heating ferrous sulphate. Who reported all the observations correctly? 1

Student	Initial colour of ferrous sulphate	Colour of the residue	Colour of the gas evolved	Nature of the gas
a)	White	White	Yellow	Acidic
b)	Green	Brownish	Colourless	Acidic
c)	Blue	White	Reddish	Basic
d)	White	Yellow	Reddish	Neutral

5. 5 ml solution of H_2SO4 is found to be completely neutralized by 5 ml of a given solution of KOH. If we take10 ml of same solution of H_2SO_4, the amount of $Ca(OH)_2$ solution of the same concentration as that of KOH required for complete neutralization will be: 1
   a) 5 ml
   b) 10 ml
   c) 20 ml
   d) 2.5 ml

6. Priya took 5ml of Silver Nitrate solution in a beaker and added approximately 4ml solution of Sodium Bromide to it. What would she observe? 1
   a) The solution turned red.
   b) Yellow precipitate was formed.
   c) White precipitate was formed.
   d) The reaction mixture became hot.

7. An element X on exposure to moist air turns reddish-brown and a new compound Y is formed. The substance X and Y are 1
   a) X = Fe, Y = Fe_2O_3
   b) X = Ag, Y = Ag_2S
   c) X = Cu, Y = CuO
   d) X = Al, Y = Al_2O_3

8. Which of the following phenomena of light are involved in the formation of a rainbow? 1
   a) Reflection, refraction and dispersion
   b) Refraction, dispersion and total internal reflection
   c) Refraction, dispersion and internal reflection
   d) Dispersion, scattering and total internal reflection

9. Electrical resistivity of a given metallic wire depends upon its 1
   a) length
   b) thickness
   c) shape
   d) nature of the material

10. Where are proteins first digested in the alimentary canal? 1
   a) Oesophagus
   b) Small Intestine
   c) Stomach

d) Buccal cavity

11. Which of the following organs is responsible for storing and concentrating bile? 1
    a) Small intestine
    b) Liver
    c) Pancreas
    d) Gall bladder

12. Under the high-power objective of a microscope, an epidermal peel of a leaf shows: 1
    a) stomata surrounded by several guard cells each.
    b) stomata surrounded by a pair of epidermal cells.
    c) stomata surrounded by a pair of guard cells each.
    d) stomata surrounded by a single guard cell.

13. How does gaseous exchange take place in woody plants? 1
    a) Epidermal cells
    b) Stomata
    c) Lenticels
    d) Root hair

14. During deficiency of oxygen in tissues of human beings, pyruvic acid is converted into lactic acid in the: 1
    a) Golgi bodies
    b) Mitochondria
    c) Endoplasmic Reticulum
    d) Cytoplasm

15. Movement of the synthesized products from the leaves to the roots and other parts of a plant's body takes place through the phloem. This process is known as: 1
    a) Translocation
    b) Transpiration
    c) Transportation
    d) Excretion

16. Choose the correct path of urine in our body: 1
    a) Kidney → Ureter → Urethra → Urinary bladder
    b) Urinary bladder → Kidney → Ureter → Urethra
    c) Kidney → Urinary bladder→ Urethra → Ureter
    d) Kidney → Ureter → Urinary bladder → Urethra

Question 17-20 are Assertion and Reasoning. Choose the following options
    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 and R is true.

17. Assertion [A]: Ammonium sulphate is acidic salt. 1
    Reason [R]: It is a salt of weak base and strong acid.

18. Assertion [A]: When a battery is short-circuited, the terminal voltage is zero.
Reason [R]: In the situation of a short-circuit, the current is zero.

19. Assertion [A]: The purpose of making urine is to filter out undigested food from intestine 1
Reason [R]: Kidneys filter the waste and produce urine.

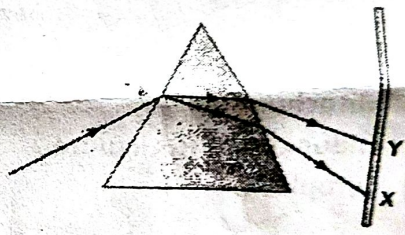
20. Assertion [A]: Biotic components of ecosystem continuously require energy to carry on life processes. 1
Reason [R]: Abiotic components are the non-living factors of the ecosystem.

Section: B

21. A metal X does not react with cold water but reacts with hot water and start floating on it. Giving reasons identify metal X. Write the balanced chemical equation of metal X with water. 2

22. Akul wants to have an erect image of an object, using a converging mirror of focal length 32 cm. 2
a) Specify the range of distance where the object can be placed in front of the mirror.
b) Will the image be bigger or smaller than the object?
c) Draw a ray-diagram to show the image formation in this case.

23. In the given figure, a narrow beam of white light is shown to pass through a triangular glass prism. After passing through the prism, it produces a spectrum XY on a screen. 2
a) State the color seen at X and Y.
b) Why do different colors of white light bend through different angles with respect to the incident beam of light?



24. What is the fate of glucose in anaerobic organisms such as yeast? Explain with the help of a flowchart. 2

25. Why is improper disposal of waste a curse to environment? Give any two reasons. 2

OR

a) Arrange the following organisms into a food chain:
Leaf, Mongoose, Snake, Caterpillar, Chameleon
b) If the amount of energy available at the third trophic level is 100 joules, then how much energy will be available at the producer level? Justify your answer.

26. Why are crop fields known as artificial ecosystem? 2

Section C

27. A student dropped few pieces of marble in dilute hydrochloric acid contained in a test tube. The evolved gas was passed through lime water. What change would be observed in lime water? Write balanced chemical equations for the reaction when: 3
a) Gas was evolved.
b) Gas was passed through lime water.
c) Gas was passed through lime water in excess.

Explain the following: 3

a) Anodising.
b) Amphoteric oxides.
c) Electrolytic reduction.

29. a) Why do stars twinkle? 2
b) Why does the sky appear dark instead of blue to an astronaut? 1

OR

Explain

a) What is atmospheric refraction? 1
b) The time difference between actual sunset and apparent sunset is about 2 minutes. 2

30. a) What is meant by saying that the potential difference between two points is 1 V? 1
b) Will current flow more easily through a thick wire or a thin wire of the same material, when connected to the same source? Why? 1
c) How much work is done in moving a charge of 2C across two points having a potential difference 12 V? 1

31 a) On what factors does the resistance of a conductor depend? 1
b) A wire of given material having length *l* and area of cross-section *A* has a resistance of 24Ω. What would be the resistance of another wire of the same material having length *l*/4 and area of cross-section 3*A*? 2

32. *Give reasons for the following:* 3
a) *The walls of ventricles are thicker than the walls of auricles in human heart.*
b) *Arteries lack valves but veins show the presence of valves.*
c) *Capillaries are only one cell layer thick.*

33. Kidneys are referred to as the chief chemist of the body. Explain the steps in which urine formation takes place in the kidneys. 3

Section: D

34. Give reasons: 5
a) Metals are good conductors of electricity.
b) An iron knife when dipped copper sulphate solution turns the blue solution to light green.
c) Potassium metal is kept immersed in kerosene.
d) Aqueous solution of HNO_3 conduct electricity.
e) Ionic compounds have high melting points.

OR

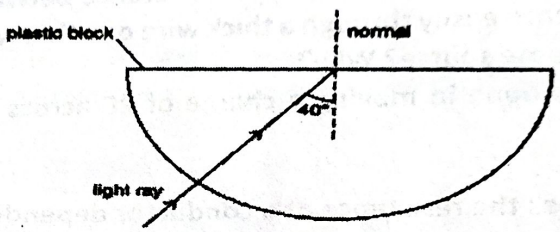
Give reasons:

a) Non-metals are poor conductors of electricity.
b) Solution of NaCl conducts electricity.
c) Sodium metal is kept immersed in kerosene.
d) Hydrogen gas is not produced when Zinc is reacted with nitric acid.
e) Dry HCl does not change the colour of dry litmus paper.

35. a) Draw ray diagrams showing the image formation by a
(i) Concave lens when an object is placed between focus and twice the focal length of th lens.
(ii) Concave mirror when an object is placed beyond twice the focal length of mirror.
b) The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. If the image is three times the size of the flame and the distance between the flame and its image is 80 cm, at what distance should the candle be placed from the lens? Also, find the nature and position of the image?

OR

a) Explain why the refractive index of any material with respect to air is always greater than 1. 1
b) Find the refractive index of medium A (n_A=4/3) with respect to medium B (n_B=7/6). 1
c) In the fig. below a light ray travel from air into the semi-circular plastic block. Give a reason why the ray does not deviate at the semi-circular boundary of the plastic block. 1



d) Complete the ray diagram of the above scenario when the light ray comes out of the plastic block from the top flat end. 2

36. a) Draw a schematic representation of double circulation of blood in humans.
b) Why is circulation in human beings referred to as 'double circulation'? 5

OR

a) Write any three points of significance of lymph in human transport system.
b) What do the following transport along with the route? 5
(i) Pulmonary vein
(ii) Pulmonary artery
(iii) Vena Cava
(iv) Aorta

Section E

37. Metals are the elements which are often found in nature in combined form as ores but few metals occur in free state too. Metals possess such specific properties which make them very useful in practical life. The properties shown by them are lustrous surface, they can also be polished for obtaining a highly reflective surface, hard and strong in nature, good conductor of heat and electricity and also malleable and ductile. But few metals are exceptionally different too in some properties like Sodium and Potassium are exceptional cases in this case as they can be cut with knife. Metallic elements possess high melting and boiling points too. 4
a) How are metals present towards the bottom of activity series extracted?
b) Write the balanced chemical equations involved.

38. The ability of a medium to refract light is expressed in terms of its optical density. Optical density has a definite connotation. It is not the same as mass density. On comparing two media,

the one with the large refractive index is optically denser medium than the other. The other medium with a lower refractive index is optically rarer. Also, the speed of light through a given medium is inversely proportional to its optical density.

a) Determine the speed of light in diamond if the refractive index of diamond with respect to vacuum is 2.42. Speed of light in vacuum is 3×10^8 m/s. 1

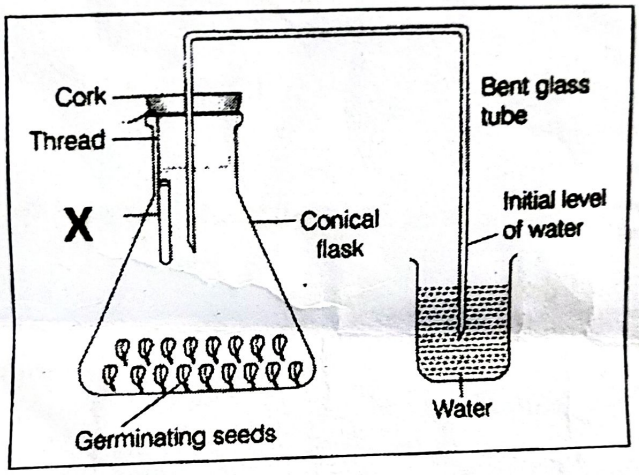
b) Refractive indices of glass, water and carbon disulphide are 1.5, 1.33 and 1.62 respectively. If a ray of light is incident in these media at the same angle (say θ), then write the increasing order of the angle of refraction in these media. 1

c) The speed of light in glass is 2×10^8 m/s and in water is 2.25×10^8 m/s.

(i) Which one of the two is optically denser and why? 1

(ii) A ray of light is incident normally at the water-glass interface when it enters a thick glass container filled with water. What will happen to the path of the ray after entering the glass? Give reason 1

39. Observe the diagram given below and answer the following questions: 4



a) What is the aim of the experiment?

b) Identify the liquid 'X' in the small test-tube?

c) What is the observation of this experiment? Give reason for the observation.

d) What will happen if the seeds in the conical flask are replaced with boiled seeds? Justify your answer with a proper reason.

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