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| ROLL NUMBER | | | | |
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| CODE NUMBER | 086/1/1 |
| SET NUMBER | 1 |



INDIAN SCHOOL MUSCAT
FIRST PRE BOARD EXAMINATION 2023
086 SCIENCE



CLASS : X
DATE: 07/12/23

TIME ALLOTTED : 3 HRS.
MAXIMUM MARKS: 80

GENERAL INSTRUCTIONS:

General Instructions:

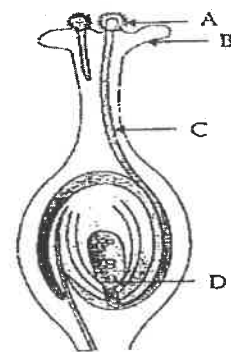
- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. 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.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answer to these questions should be in the range of 50 to 80 words.
- vi. 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.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section-A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.

1. Which of the following statements are correct about an aqueous solution of an acid and of a base?
(i) Higher the pH, stronger the acid
(ii) Higher the pH, weaker the acid
(iii) Lower the pH, stronger the base
(iv) Lower the pH, weaker the base
(a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (ii) and (iv)
2. Aqua regia is a mixture of con HCl and con HNO₃ in the ratio of:
(a) 1:1 by volume (b) 2:1 by volume (c) 3:1 by volume (d) 1:3 by volume

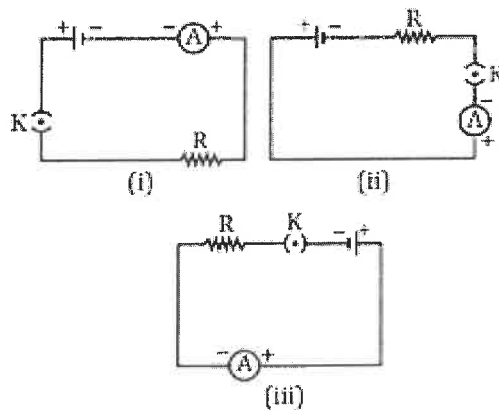
3. Ammonium chloride is obtained from which base & acid? 1
 (a) NH_4OH & HCl (b) HCl & NH_4OH (c) NaOH & HCl (d) HNO_3 & HCl
4. The no of C-H bond in the formula of Ethene are: 1
 (a) 5 (b) 6 (c) 2 (d) 4
5. Reddish brown deposit obtained on iron nails when kept in a solution of CuSO_4 in water is that of: 1
 (a) Cu_2O (b) Cu (c) CuO (d) CuS
6. The removal of hydrogen from a substance in a redox reaction is known as: 1
 (a) Oxidation (b) Reduction (c) Dehydration (d) None is true
7. The given solution of Lead nitrate, in order to obtain a yellow precipitate, must be mixed with: 1
 (a) potassium chloride (b) potassium nitrite (c) potassium iodide (d) potassium sulphate
8. The hormone which is responsible for the maintenance of sugar levels in the blood: 1
 (a) Growth hormone (b) Gibberellin (c) Insulin (d) Estrogen
9. In the diagram given below , the parts marked A, B, C and D are sequentially 1
 (a) Pollen gain, stigma, pollen tube, female germ cell
 (b) Pollen tube, stigma, pollen grain, female germ cell
 (c) female germ cell, Pollen gain, stigma, pollen tube,
 (d) stigma, pollen tube, female germ cell, Pollen gain,



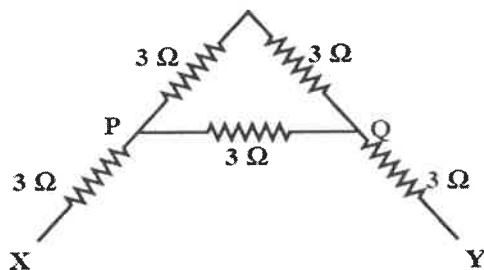
10. A zygote which has inherited Y chromosome from the father will develop into 1
 (a) Baby girl (b) baby boy (c) either girl or boy (d) adult
11. If the ratio of each phenotype of seeds of pea plants in the F₂ generation is 9:3:3:1, it is known as: 1
 (a) Dihybrid cross (b) monohybrid cross (c) trihybrid cross (d) tetrahybrid cross
12. In human beings inherited traits can be influenced by 1
 (a) Paternal DNA only
 (b) maternal DNA only
 (c) both maternal and paternal DNA

(d) neither by paternal nor by maternal DNA

13. A cell, a resistor, a key and ammeter are arranged as shown in the circuit diagrams of the figure. The current recorded in the ammeter will be 1



- (a) Maximum (ii) (c) The same in all the cases
 (b) Maximum (iii) (d) Maximum (i)
14. Five resistors, each $3\ \Omega$, are connected as shown in Fig. Calculate the resistance between the points P and Q. 1



- (a) $2\ \Omega$ (b) $3\ \Omega$ (c) $9\ \Omega$ (d) None of these
15. When a fuse is rated 8A, it means. 1
- (a) It will not work if current is less than 8A
 (b) It has a resistance of 8 ohm
 (c) It will work only if current is 8A
 (d) It will burn if current exceeds 8A
16. Which of the following events does not occur in photosynthesis? 1
- (a) Conversion of light energy into chemical energy
 (b) Reduction of carbon dioxide to carbohydrates
 (c) Oxidation of carbon to carbon dioxide
 (d) Absorption of light energy by chlorophyll

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- a) Both A and R are true, and R is the correct explanation of A.
b) Both A and R are true, and R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.
17. Assertion (A): On changing the direction of flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed. 1
Reason (R): The direction of magnetic field around a conductor can be given in accordance with left hand thumb rule.
18. Assertion (A) : The resistivity of a substance does not depend on the nature of the substance and temperature. 1
Reason (R): The resistivity of a substance is a characteristic property of the material.
19. Assertion: Con: Sulphuric acid has to be diluted very carefully. 1
Reason: The acid has a strong affinity for water and the dilution process is highly exothermic in nature.
20. Assertion (A): Capillaries have walls that are just one cell thick. 1
Reason (R): The exchange of material between the blood and surrounding cells takes place across the capillaries.

Section – B

Question No. 21 to 26 are very short answer questions

21. Most metal oxides are insoluble in water but some of these dissolve in water. What are these oxides and their solution in water called? 2
22. a. Which gland secretes digestive enzymes as well as hormones? 2
b. Name the endocrine gland associated with kidneys.
23. Oxygen, mostly, is carried by a pigment in our blood whereas carbon dioxide is transported in dissolved form in our blood. Give reason. 2

OR

A sportsman, after a long break of his routine exercise, suffered muscular cramps during a heavy exercise session. Give reason

24. Why is Government of India imposing a ban on the use of plastic bags? Suggest two alternatives to these bags. 2

25. Name the defect of vision caused by (i) Excessive curvature of the eye lens (ii) Power of accommodation of eye decreases 2

OR

Draw a ray diagram to show the formation of a rainbow and mark the point where (i) dispersion, (ii) internal reflection occurs

26. Enlist the site of synthesis and storage of bile. 'Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion.' Justify the statement. 2

Section-C

Question No. 27 to 33 are short answer questions

27. Identify the type of chemical reactions with balanced chemical equations that take place in the following: 3
- a) Magnesium ribbon is burnt in air.
 - b) Electric current is passed through water.
 - c) Ammonia and hydrogen chloride gasses are mixed.
28. In the formation of a compound XY_2 , atom X donates one electron to each Y atom. Show the electron dot structure of X and Y and the formation of XY_2 . What is the nature of bond in XY_2 ? Write any two properties of compound XY_2 . 3

OR

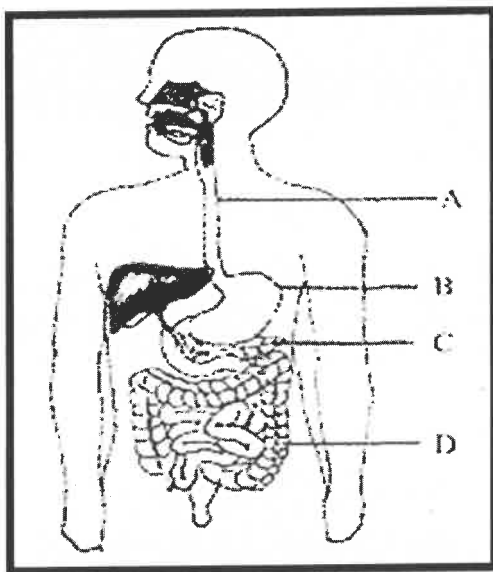
- (a) Define an Ore.
- (b) Write two differences between Calcination and Roasting.

29. Consider the following food chain and answer the following questions. 3

Grass → insect → frog → snake

- (a) If 1000J of energy is available at producer level. Calculate the energy available to the snake in the form of food
- (b) Which organism will be the most affected when a non-biodegradable pesticide is introduced into the soil?
- (c) What is the phenomenon responsible for this called?

30. Observe the diagram of digestive system of human beings given below and answer the following questions. 3



- a. Label the parts marked **A, B, C and D**
b. What is the role of part 'B' in digestion of food?
31. Describe an activity with labelled diagram to show that a force acts on current carrying conductor placed in a magnetic field and its direction of current through conductor. Name the rule which determines the direction of this force. 3
32. Draw ray diagrams showing the image formation by a convex lens when an object is placed 3
(a) between optical centre and focus of the lens
(b) between focus and twice the focal length of the lens
33. An object 5 cm in length is placed at a distance of 20 cm in front of a convex mirror of radius of curvature 30 cm. Find the position of the image, its nature and size. 3

Section-D

Question No. 34 to 36 are long answer questions.

34. (a) What is Catenation? 5
(b) Write name and molecular formula of the second member of the homologous series of alkynes.
(c) What is esterification reaction? Give one example with a balanced chemical equation.
(d) Give one chemical test to distinguish between ethanoic acid and ethanol.

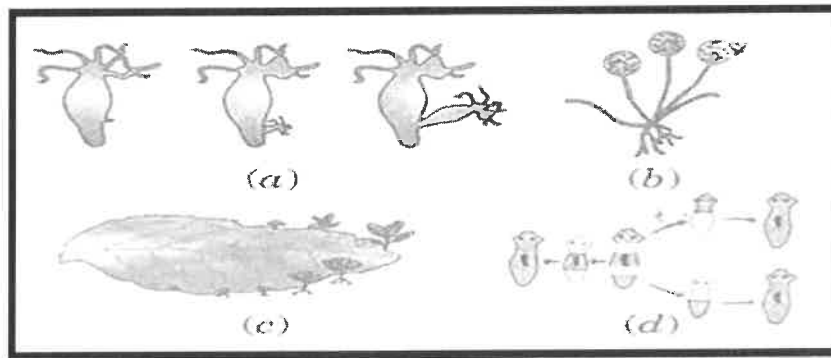
OR

- (a) Draw the structure of cyclo propane.

- (b) What are saturated hydrocarbons?
- (c) Compare Diamond and Graphite. **(any 2)**
- (d) Explain the cleansing action of soap.

35. a) Identify the organisms in **Figures A, B, C, and D.**

5



- b) Identify the life process commonly shown in all the figures.
- c) How is this life process advantageous to the organisms? Mention any two advantages.

OR

Explain what happens when:

- a) Testosterone is released in males.
- b) Pollen grain falls on the stigma of the flower.
- c) Egg fuses with a sperm cell.
- d) Planaria is cut into many pieces.
- e) Buds are formed on the notches of the Bryophyllum leaf.

36. (a) Define electrical energy with S.I. unit?

5

(b) A house hold uses the following electric appliance

- (i) Refrigerator of rating 400w for ten hour each day.
- (ii) Two electric fans of rating 80w each for twelve hours each day.
- (iii) Six electric tubes of rating 18w each for six hours each day.

Calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is Rs 3

OR

(a) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.

(b) In an electric circuit two resistors of $12\ \Omega$ each are joined in parallel to a $6\ \text{V}$ battery. Find the current drawn from the battery.

SECTION - E

Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts.

Internal choice is provided in one of these sub-parts.

37. Metals with moderate reactivity present in the middle of their reactivity series eg. Cu, Ni, Co, Zn etc...are purified by a process known as electro refining. The process is generally carried in a container made of glass in which the soluble salt of the metal to be purified as the electrolyte. 4
- a) (i) In the electrorefining of copper, name the electrolyte used.
(ii) Which name is given to the impurities that are left at the anode.

b) What happens to copper rod at anode during electrolysis?

OR

Name the anode and the cathode used during the process

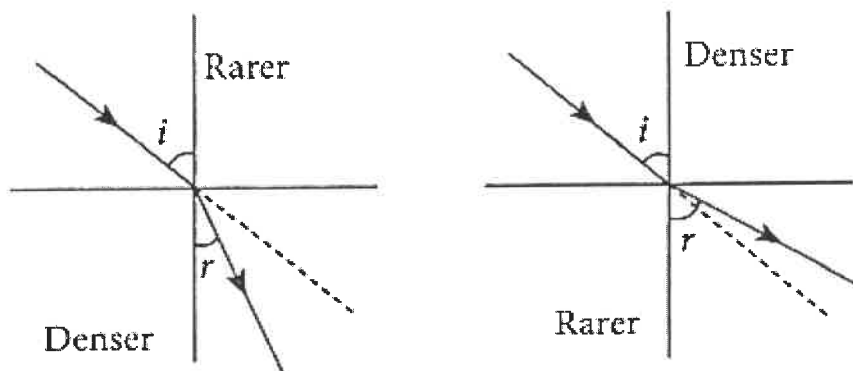
38. A cross was carried out between pure breed tall (TT) pea plant with pure dwarf (tt) pea plant and F1 progeny was obtained. Later, F1 progeny was self -pollinated to obtain F2 progeny. In F1 progeny – no ‘medium-height’ plants. Only one of the parental traits was seen. Mendelian experiments test this by getting both the parental plants and these F1 tall plants to reproduce by self-pollination 4
- a. Explain the inheritance pattern of F1 and F2 generations with the help of a monohybrid cross following the rules of inheritance of traits.
- b. What type of plants obtained in F1 generation? Why?

OR

What is the phenotypic and genotypic ratio of F2 generation?

39. When the rays of light travels from one transparent medium to another, the path of light is deviated. This phenomenon is called refraction of light. The bending of light depends on the optical density of medium through which the light passes. 4





The speed of light varies from medium to medium. A medium in which the speed of light is more is optically rarer medium whereas in which the speed of light is less is optically denser medium. Whenever light goes from one medium to another, the frequency of light does not change however, speed and wavelength change. It concluded that change in speed of light is the basic cause of refraction.

(i) When light travels from air to glass, the ray of light bends

- (a) towards the normal (b) away from normal
(c) anywhere (d) none of these

(ii) A ray of light passes from a medium A to another medium B. No bending of light occurs if the ray of light hits the boundary of medium B at an angle of

- (a) 0° (b) 45°
(c) 90° (d) 120°

(iii) If refractive index of glass with respect to air is $\frac{3}{2}$, what is the refractive index of air with respect to glass?

OR

The speed of light in water is 2.25×10^8 m/s. If the speed of light in a vacuum is 3×10^8 m/s, calculate the refractive index of water.

******END OF THE QUESTION PAPER******

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| CODE NUMBER | 086/1/2 |
| SET NUMBER | 2 |



INDIAN SCHOOL MUSCAT
FIRST PRE BOARD EXAMINATION 2023
086 SCIENCE



CLASS : X
DATE: 07.12.23

TIME ALLOTTED : 3 HRS.
MAXIMUM MARKS: 80

GENERAL INSTRUCTIONS:

General Instructions:

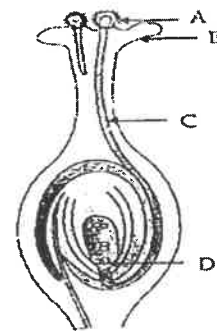
- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. 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.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answer to these questions should be in the range of 50 to 80 words.
- vi. 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.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section-
A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.

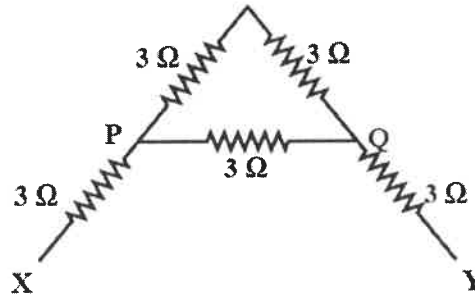
1. Which of the following will give white ppt with sodium sulphate solution? 1
(a) Barium Chloride (b) Barium Carbonate (c) Barium Sulphate (d) Copper Chloride
2. When Zinc reacts with dil: HCl: 1
(a) The surface of Zinc becomes black and dull. (b) The surface of Zinc becomes brighter.
(c) The reaction mixture turns green. (d) The metal turns into powder.
3. The student tested the pH of distilled water and found that the colour of pH paper changed 1
to green. He checked the pH again after dissolving a pinch of common salt in it. The colour
of the pH paper this time was:

- (a) Yellow (b) Red (c) Blue (d) Green
4. The IUPAC name of CH_3CHO is: 1
 (a) acetaldehyde (b) methyl aldehyde (c) formyl chloride (d) ethanal
5. The gases obtained on heating of FeSO_4 are: 1
 (a) SO_2 (b) SO_3 (c) H_2S (d) Both (a) and (b)
6. The difference of the molecules of water in Gypsum and Plaster of Paris is: 1
 (a) $5/2$ (b) 2 (c) $3/2$ (d) $1/2$
7. Main constituents of Bronze alloy are: 1
 (a) Copper and zinc (b) copper and nickel (c) copper and magnesium (d) copper and tin
8. Which of the following events does not occur in photosynthesis? 1
 (a) Conversion of light energy into chemical energy
 (b) Reduction of carbon dioxide to carbohydrates
 (c) Oxidation of carbon to carbon dioxide
 (d) Absorption of light energy by chlorophyll
9. The plant part which exhibits negative geotropism is: 1
 (a) Root (b) stem (c) branch (d) leaves
10. In the diagram given below, the parts marked A, B, C and D are sequentially 1
 (a) Pollen grain, stigma, pollen tube, female germ cell
 (b) Pollen tube, stigma, pollen grain, female germ cell
 (c) female germ cell, Pollen grain, stigma, pollen tube,
 (d) stigma, pollen tube, female germ cell, Pollen grains.

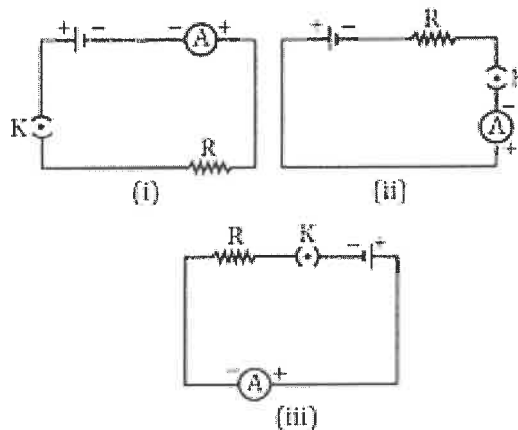


11. In human beings inherited traits can be influenced by 1
 (a) Paternal DNA only
 (b) maternal DNA only
 (c) both maternal and paternal DNA
 (d) neither by paternal nor by maternal DNA
12. If the ratio of each phenotype of seeds of pea plants in the F_2 generation is 9:3:3:1, it is known as: 1
 (a) Dihybrid cross (b) monohybrid cross (c) trihybrid cross (d) tetrahybrid cross

13. When a fuse is rated 8A, it means. 1
- (a) It will not work if current is less than 8A
 (b) It has a resistance of 8 ohm
 (c) It will work only if current is 8A
 (d) It will burn if current exceeds 8A
14. Five resistors, each $3\ \Omega$, are connected as shown in Fig . Calculate the resistance between the points P and Q. 1



- (a) $2\ \Omega$ (b) $3\ \Omega$ (c) $9\ \Omega$ (d) None of these
15. A cell, a resistor, a key and ammeter are arranged as shown in the circuit diagrams of the figure. The current recorded in the ammeter will be 1



- (a) Maximum (ii) (c) Maximum (i)
 (b) Maximum (iii) (d) The same in all the cases
16. A zygote which has inherited X chromosome from father will develop into 1
- (a) Baby girl (b) baby boy (c) either girl or boy (d) adult

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- a) Both A and R are true, and R is the correct explanation of A.

- b) Both A and R are true, and R is not the correct explanation of A.
- c) A is true but R is false.
- d) A is false but R is true.
17. Assertion (A) : The resistivity of a substance does not depend on the nature of the substance and temperature. 1
Reason (R): The resistivity of a substance is a characteristic property of the material
18. Assertion (A): On changing the direction of flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed. 1
Reason (R) : The direction of magnetic field around a conductor can be given in accordance with left hand thumb rule.
19. Assertion: Decay of teeth is due to the decrease in p H in the mouth. 1
Reason: Acids released slowly destroy the enamel coating which protects teeth.
20. Assertion (A): Capillaries have walls that are just one cell thick. 1
Reason (R): The exchange of material between the blood and surrounding cells takes place across the capillaries

Section – B

Question No. 21 to 26 are very short answer questions

21. The reaction of a metal X with Fe_2O_3 is highly exothermic and is used to join railway tracks. 2
Identify the metal X. Write the chemical equation for the reaction.
Also state the nature of the oxide of Xa.
22. Enlist the site of synthesis and storage of bile. 'Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion.' Justify the statement 2
23. Oxygen, mostly, is carried by a pigment in our blood whereas carbon dioxide is transported in dissolved form in our blood. Give reason. 2

OR

A sportsman, after a long break of his routine exercise, suffered muscular cramps during a heavy exercise session. Give reason.

24. Gas A, found in the upper layers of the atmosphere (Stratosphere), is a deadly poison but is essential for all living beings. The amount of this gas started declining sharply in the 1980s. 2
a) Identify Gas A. How is it formed at higher levels of the atmosphere?
b) How is this Gas A both beneficial and damaging?

25. Name the defect of vision caused by (i) Excessive curvature of the eye lens (ii) Power of accommodation of eye decreases 2

OR

Draw a ray diagram to show the formation of a rainbow and mark the point where dispersion, (ii) internal reflection occurs

26. a. Which gland secretes digestive enzymes as well as hormones? 2
b. Name the endocrine gland associated with kidneys.

Section-C

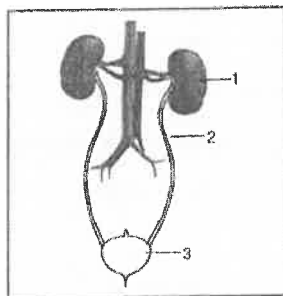
Question No. 27 to 33 are short answer questions

27. Write equations for each decomposition reaction, where energy is supplied in the form of heat, light and electricity. 3
28. A metal E is stored under kerosene. When a small piece of it is exposed to air, it catches fire. 3
When the product formed is dissolved in water, it turns red litmus to blue.
(a) Name the metal E.
(b) Write the chemical equation for the reaction, when it is exposed to air.
(c) Name the process by which the metal E is obtained from its molten chloride.

OR

- (a) With the help of electron dot diagram, explain the formation of Calcium chloride.
(b) Ionic compounds conducts electricity only in the molten state or in the aqueous state. Justify
29. Consider the following food chain and answer the following questions. 3
Grass → insect → frog → snake
(a) If 1000J of energy is available at producer level. Calculate the energy available to the snake in the form of food
(b) Which organism will be the most affected when a non-biodegradable pesticide is introduced into the soil?
(c) What is the phenomenon responsible for this called?

30. Observe the diagram of the excretory system of human beings given below and answer the following questions. 3



- a. Label the parts marked 1, 2 and 3 and Write the function of part 3.
 - b. Name the basic excretory unit of part 1.
 - c. What is the purpose of making urine?
31. (a) Draw the pattern of magnetic field lines due to a magnetic field through and around a current carrying circular loop. 3
 (b) Name and state the rule to find out the direction of magnetic field inside and around the loop.
 32. Draw ray diagrams to show the image formed by a concave lens for the 3
 - (i) object placed at infinity
 - (ii) object placed between infinity and optical centre of the lens
 33. A concave mirror produces three times enlarged virtual image of an object placed at 10 cm in front of it. Calculate the radius of curvature of the mirror. 3

Section-D

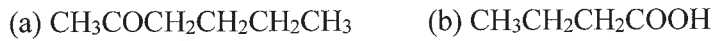
Question No. 34 to 36 are long answer questions.

34. An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. The compound reacts with ethanol to form a sweet smelling compound B. 5
 - (1) Identify the compound A.
 - (2) Write the chemical equation for its reaction with ethanol to form compound B.
 - (3) How can we get A back from B?
 - (4) Name the process and write the corresponding chemical equation.
 - (5) Which gas is formed when compound A reacts with washing soda? Write the chemical equation.

OR

- (1) Why does carbon form large number of compounds?
- (2) What are unsaturated hydrocarbons?

(3) Name the functional groups present in the following compounds:

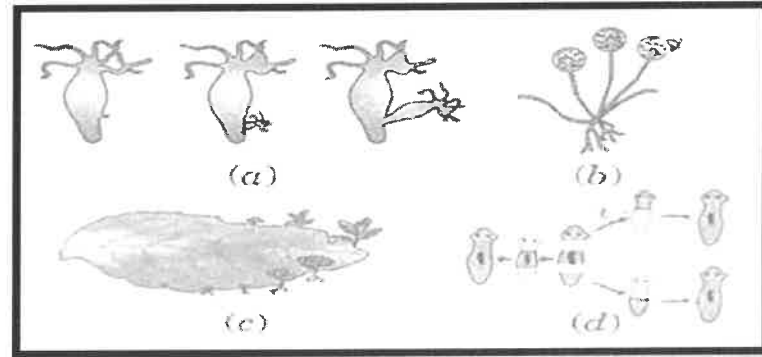


(4) Explain the given reactions with an example:

(a) Hydrogenation reaction (b) Substitution reaction

35. a. Identify the organisms in Figures A, B, C, and D.

5



b. Identify the life process commonly shown in all the figures.

c. How is this life process advantageous to the organisms? Mention any two advantages.

OR

Explain what happens when:

- Testosterone is released in males.
- Pollen grain falls on the stigma of the flower.
- Egg fuses with a sperm cell.
- Planaria is cut into many pieces.
- Buds are formed on the notches of the Bryophyllum leaf.

36. (a) Define electrical energy with S.I. unit?

5

(b) A house hold uses the following electric appliance

- Refrigerator of rating 400w for ten hour each day.
- Two electric fans of rating 80w each for twelve hours each day.
- Six electric tubes of rating 18w each for 6 hours each day.

Calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is Rs 3

OR

(a) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.

(b) In an electric circuit two resistors of $12\ \Omega$ each are joined in parallel to a 6 V battery. Find the current drawn from the battery.

SECTION - E

Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts.

Internal choice is provided in one of these sub-parts.

37. Metals with moderate reactivity present in the middle of their reactivity series eg. Cu, Ni, Co, Zn etc...are purified by a process known as electro refining. The process is generally carried in a container made of glass in which the soluble salt of the metal to be purified acts as the electrolyte. 4

a) (i) In the electrorefining of copper, name the products obtained at cathode and anode.

(ii) Which name is given to the impurities that are left at the anode.

b) What happens to Cu^{2+} ions migrating towards the cathode?

OR

Name one ore of copper.

38. A cross was carried out between pure breed tall (TT) pea plant with pure dwarf (tt) pea plant and F₁ progeny was obtained. Later, F₁ progeny was self-pollinated to obtain F₂ progeny. In F₁ progeny – no 'medium-height' plants. Only one of the parental traits was seen. Mendelian experiments test this by getting both the parental plants and these F₁ tall plants to reproduce by self-pollination 4

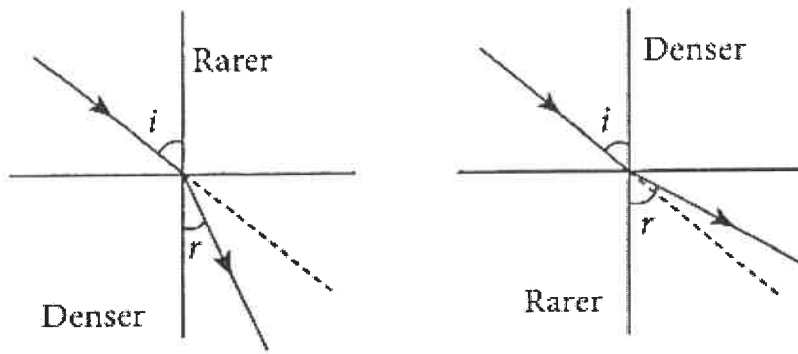
a. Explain the inheritance pattern of F₁ and F₂ generations with the help of a monohybrid cross following the rules of inheritance of traits.

b. What type of plants obtained in F₁ generation? Why?

OR

What is the phenotypic and genotypic ratio of F₂ generation?

39. When the rays of light travel from one transparent medium to another, the path of light is deviated. This phenomenon is called refraction of light. The bending of light depends on the optical density of medium through which the light passes. 4



The speed of light varies from medium to medium. A medium in which the speed of light is more is optically rarer medium whereas in which the speed of light is less is optically denser medium. Whenever light goes from one medium to another, the frequency of light does not change however, speed and wavelength change. It concluded that change in speed of light is the basic cause of refraction.

(i) When light travels from air to glass, the ray of light bends

- (a) towards the normal (b) away from normal
(c) anywhere (d) none of these

(ii) A ray of light passes from a medium A to another medium B. No bending of light occurs if the ray of light hits the boundary of medium B at an angle of

- (a) 0° (b) 45°
(c) 90° (d) 120°

(iii) If refractive index of glass with respect to air is $\frac{3}{2}$, what is the refractive index of air with respect to glass?

OR

The speed of light in water is 2.25×10^8 m/s. If the speed of light in a vacuum is 3×10^8 m/s, calculate the refractive index of water.

******END OF THE QUESTION PAPER******

Shari 20

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INDIAN SCHOOL MUSCAT
FIRST PRE BOARD EXAMINATION 2023
086 SCIENCE



CLASS : X
DATE: 07/12/23

TIME ALLOTTED : 3 HRS.
MAXIMUM MARKS: 80

GENERAL INSTRUCTIONS:

General Instructions:

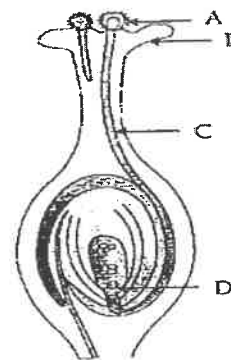
- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. 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.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answer to these questions should be in the range of 50 to 80 words.
- vi. 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.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section-
A

Select and write the most appropriate option out of the four options given for each of the questions 1 - 20.
There is no negative mark for incorrect response.

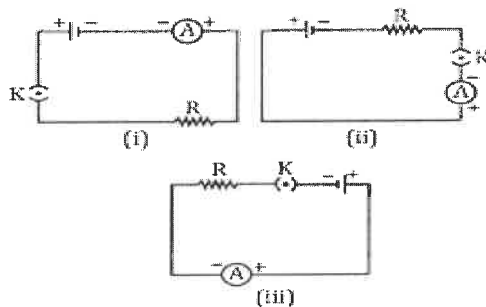
1. The no of C-H bond in the formula of Ethene are: 1
(a) 5 (b) 6 (c) 2 (d) 4
2. Main constituents of Bronze alloy are: 1
(a) Copper and zinc (b) copper and nickel (c) copper and magnesium (d) copper and tin
3. Ammonium chloride is obtained from which base & acid? 1
(a) NH_4OH & HCl (b) HCl & NH_4OH (c) NaOH & HCl (d) HNO_3 & HCl
4. The removal of hydrogen from a substance in a redox reaction is known as: 1
(a) Oxidation (b) Reduction (c) Dehydration (d) None is true
5. Which of the following will give white ppt with sodium sulphate solution? 1
(a) Barium Chloride (b) Barium Carbonate (c) Barium Sulphate (d) Copper Chloride

6. When Zinc reacts with dil: HCl: 1
 (a) The surface of Zinc becomes black and dull. (b) The surface of Zinc becomes brighter.
 (c) The reaction mixture turns green. (d) The metal turns into powder.
7. Which of the following statements are correct about an aqueous solution of an acid and of a base? 1
 (i) Higher the pH, stronger the acid
 (ii) Higher the pH, weaker the acid
 (iii) Lower the pH, stronger the base
 (iv) Lower the pH, weaker the base
 (a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (ii) and (iv)
8. The bending of the shoot of a plant in response to light is called? 1
 (a) Phototropism (b) geotropism (c) chemotropism (d) hydrotropism
9. If the ratio of each phenotype of seeds of pea plants in the F₂ generation is 9:3:3:1, it is known as: 1
 (a) Dihybrid cross (b) monohybrid cross (c) trihybrid cross (d) tetrahybrid cross
10. A zygote which has inherited Y chromosome from father will develop into 1
 (a) Baby girl (b) baby boy (c) either girl or boy (d) adult
11. In the diagram given below , the parts marked A, B, C and D are sequentially 1
 (a) Pollen gain, stigma, pollen tube, female germ cell
 (b) Pollen tube, stigma, pollen grain, female germ cell
 (c) female germ cell, Pollen gain, stigma, pollen tube,
 (d) stigma, pollen tube, female germ cell, Pollen gain,

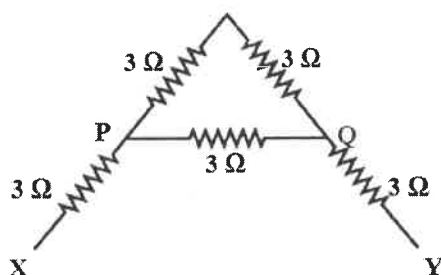


12. In human beings inherited traits can be influenced by 1
 (a) Paternal DNA only
 (b) maternal DNA only
 (c) both maternal and paternal DNA
 (d) neither by paternal nor by maternal DNA

13. A cell, a resistor, a key and ammeter are arranged as shown in the circuit diagrams of the figure. The current recorded in the ammeter will be 1



- (a) Maximum (ii) (c) Maximum (i)
 (b) Maximum (iii) (d) The same in all the cases
14. Five resistors, each $3\ \Omega$, are connected as shown in Fig . Calculate the resistance between the points P and Q. 1



- (a) $2\ \Omega$ (b) $3\ \Omega$ (c) $9\ \Omega$ (d) None of these
15. When a fuse is rated 8A, it means. 1
- (a) It will not work if current is less than 8A
 (b) It has a resistance of 8 ohm
 (c) It will work only if current is 8A
 (d). It will burn if current exceeds 8A
16. Which of the following events does not occur in photosynthesis? 1
- (a) Conversion of light energy into chemical energy
 (b) Reduction of carbon dioxide to carbohydrates
 (c) Oxidation of carbon to carbon dioxide
 (d) Absorption of light energy by chlorophyll

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

17. Assertion (A): The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is inversely proportional to the current flowing through the solenoid. 1
Reason (R): The magnitude of the magnetic field at a point on the axis of a current carrying solenoid is directly proportional to the number of turns per unit length of a solenoid.
18. Assertion (A) : The resistivity of a substance does not depend on the nature of the substance and temperature. 1
Reason (R): The resistivity of a substance is a characteristic property of the material.
19. Assertion: Lesser the p H of a solution more will be its acidic strength. 1
Reason: p H of a solution is inversely proportional to its H⁺ ion concentration.
20. Assertion (A): Capillaries have walls that are just one cell thick. 1
Reason (R): The exchange of material between the blood and surrounding cells takes place across the capillaries.

Section – B

Question No. 21 to 26 are very short answer questions

21. The reaction of a metal X with Fe₂O₃ is highly exothermic and is used to join railway tracks. 2
Identify the metal X. Write the chemical equation for the reaction.
Also state the nature of the oxide of X.
22. What is the role of decomposers in the ecosystem? 2
23. A sportsman, after a long break of his routine exercise, suffered muscular cramps during a heavy exercise session. Give reason. 2

OR

Oxygen, mostly, is carried by a pigment in our blood whereas carbon dioxide is transported in dissolved form in our blood. Give reason

24. Enlist the site of synthesis and storage of bile. 'Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion.' Justify the statement 2
25. Name the defect of vision caused by (i) Excessive curvature of the eye lens (ii) Power of accommodation of eye decreases. 2

OR

Draw a ray diagram to show the formation of a rainbow and mark the point where (i) dispersion, (ii) internal reflection occurs



26. a) Which gland secretes digestive enzymes as well as hormones? 2
b) Name the endocrine gland associated with kidneys

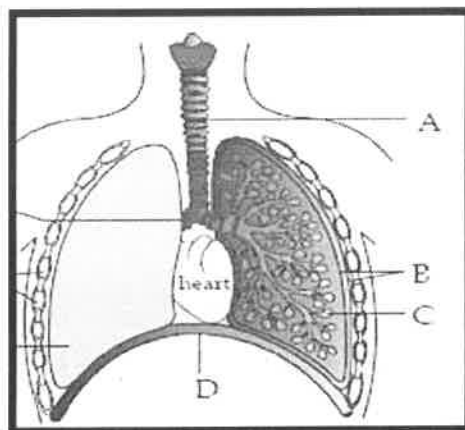
Section-C
Question No. 27 to 33 are short answer questions

27. Identify the type of chemical reactions with balanced chemical equations that take place in the following: 3
- a) Magnesium ribbon is burnt in air.
 - b) Electric current is passed through water.
 - c) Ammonia and hydrogen chloride gasses are mixed.
28. (a) Define an Ore. 3
(b) Write two differences between Calcination and Roasting.

OR

A metal E is stored under kerosene. When a small piece of it is exposed to air, it catches fire. When the product formed is dissolved in water, it turns red litmus to blue.

- (a) Name the metal E.
 - (b) Write the chemical equation for the reaction, when it is exposed to air.
 - (c) Name the process by which the metal E is obtained from its molten chloride.
29. Observe the diagram of respiratory system of human beings and answer the following 3 questions.



- a. Label the parts **marked A, C and D**.
- b. Why 'A' does not collapse?
- c. Why is part 'C' richly supplied with blood vessels?
30. Consider the following food chain and answer the following questions. 3
Grass → insect → frog → snake
- (a) If 1000J of energy is available at producer level. Calculate the energy available to the snake in the form of food
- (b) Which organism will be the most affected when a non-biodegradable pesticide is introduced into the soil?
- (c) What is the phenomenon responsible for this called?
31. (a) Draw magnetic field lines produced around a current carrying straight conductor passing through cardboard. 3
 (b) How does the strength of the magnetic field produced change
 (i) With the distance from the conductor?
 (ii) With an increase in current in a conductor?
32. Draw ray diagrams to show the image formed by a concave lens for the 3
 (i) Object placed at infinity
 (ii) Object placed between infinity and optical centre of the lens
33. A concave mirror produces three times enlarged virtual image of an object placed at 10 cm in front of it. Calculate the radius of curvature of the mirror. 3

Section-D

Question No. 34 to 36 are long answer questions.

34. (a) Draw the structure of cyclo propane. 5
 (b) What are saturated hydrocarbons?
 (c) Compare Diamond and Graphite. **(any 2)**
 (d) Explain the cleansing action of soap.

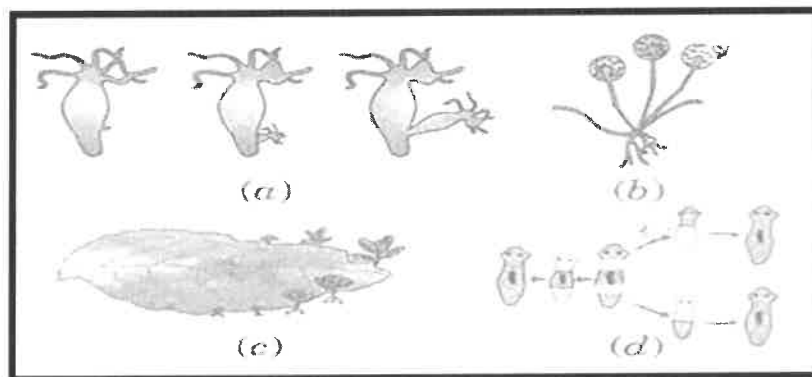
OR

An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. The compound reacts with ethanol to form a sweet smelling compound B.

- (1) Identify the compound A.
- (2) Write the chemical equation for its reaction with ethanol to form compound B.
- (3) How can we get A back from B?
- (4) Name the process and write the corresponding chemical equation.
- (5) Which gas is formed when compound A reacts with washing soda? Write the chemical equation.

35. a) Identify the organisms in **Figures A, B, C, and D.**

5



- b) Identify the life process commonly shown in all the figures.
- c) How is this life process advantageous to the organisms? Mention any two advantages.

OR

Explain what happens when:

- a) Testosterone is released in males.
- b) Pollen grain falls on the stigma of the flower.
- c) Egg fuses with a sperm cell.
- d) Planaria is cut into many pieces.
- e) Buds are formed on the notches of the Bryophyllum leaf.

36. (a) Define electrical energy with S.I. unit?

5

(b) A house hold uses the following electric appliance

- (i) Refrigerator of rating 400w for ten hour each day.
- (ii) Two electric fans of rating 80w each for twelve hours each day.
- (iii) Six electric tubes of rating 18w each for six hours each day.

Calculate the electricity bill of the household for the month of June if the cost per unit of electric energy is Rs 3

OR

- (a) With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.
- (b) In an electric circuit two resistors of $12\ \Omega$ each are joined in parallel to a 6 V battery. Find the current drawn from the battery.

SECTION - E

Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts.

Internal choice is provided in one of these sub-parts.

37. Metals with moderate reactivity present in the middle of their reactivity series eg. Cu, Ni, Co, Zn etc...are purified by a process known as electro refining. The process is generally carried in a container made of glass in which the soluble salt of the metal to be purified acts as the electrolyte. 4
- a) (i) Which name is given to the impurities that are left at the anode.
(ii) In the electrorefining of copper, name the electrolyte used.
- b) What happens to copper rod at anode during electrolysis?

OR

Name the anode and the cathode used during the process.

38. A cross was carried out between pure breed tall (TT) pea plant with pure dwarf (tt) pea plant and F1 progeny was obtained. Later, F1 progeny was self-pollinated to obtain F2 progeny. In F1 progeny – no 'medium-height' plants. Only one of the parental traits was seen. Mendelian experiments test this by getting both the parental plants and these F1 tall plants to reproduce by self-pollination 4
- a. Explain the inheritance pattern of F1 and F2 generations with the help of a monohybrid cross following the rules of inheritance of traits.
- b. What type of plants obtained in F1 generation? Why?

OR

What is the phenotypic and genotypic ratio of F2 generation?

39. The relation between distance of an object from the mirror (u), distance of image from the mirror (v) and the focal length (F) is called mirror formula. This formula is valid in all 4



situations for all spherical mirrors for all positions of the object. The size of image formed by a spherical mirror depends on the position of the object from the mirror. The image formed by a spherical mirror can be bigger than the object, equal to the object or smaller than the object. The size of the image relative to the object is given by the linear magnification (m). Thus, the magnification is given by the ratio of height of image to the height of object. If magnification is negative, image is real and if it is positive, image is virtual.

(i) What is the position of an image when an object is placed at a distance of 20 cm from a concave mirror of focal length 20 cm?

- (a) 5 cm (b) 20 cm
 (c) 10 cm (d) infinity

(ii) Which of the following ray diagrams is correct for the ray of light incident on a concave mirror as shown in figure?



(a)

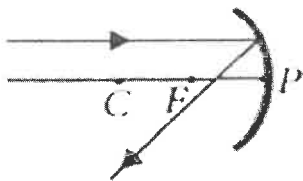


Figure A

(b)

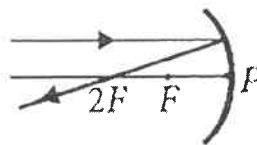


Figure B

(c)

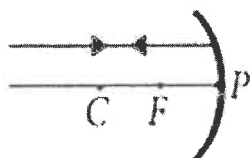


Figure C

(d)

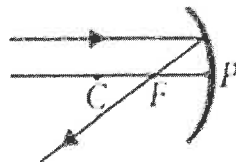


Figure D

(iii) The linear magnification of a convex mirror of focal length 15 cm is $\frac{1}{3}$. Find The distance of the object from the mirror.

OR

A concave mirror produces three times magnified (enlarged) real image of an object placed at 10 cm in front of it. Where is the image located?

******END OF THE QUESTION PAPER******