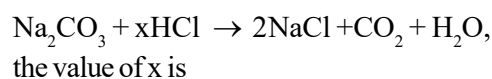


Section-A(Each 1 mark)

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. In the following equation:

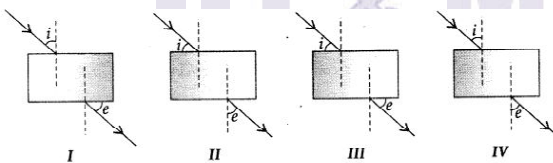


- a) 1 b) 2
c) 3 d) 4
2. The atomic numbers of four elements A, B, C and D are 6, 8, 10 and 12 respectively. The two elements which can react to form ionic bonds (or ionic compound) are:
- a) A and D b) B and C
c) A and C d) B and D
3. What happens when a solution of an acid is mixed with a solution of a base in a test tube?
- i) Temperature of the solution decreases
ii) Temperature of the solution increases
iii) Temperature of the solution remains the same
iv) Salt formation takes place
- a) (i) and (iv) b) (i) and (iii)
c) (ii) only d) (ii) and (iv)
4. The process of conversion of vegetable oils to vegetable ghee involves:
- a) Hydrogenation
b) Oxidation
c) Esterification
d) Polymerization
5. The metal which can be cut with a knife
- a) Sodium and potassium

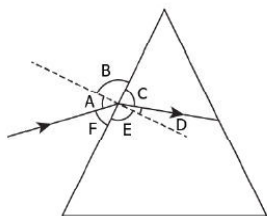
- b) Barium and calcium
c) Sodium and mercury
d) Potassium and calcium.
6. Which of the following acids are edible?
- A) Citric acid B) Tartaric acid
C) Hydrochloric acid
D) Carbonic acid
- a) (A) and (B) are correct
b) (A), (B) and (D) are correct
c) (A), (B) and (C) are correct
d) All are correct
7. The IUPAC name of
- $$\begin{array}{c} \text{CH}_3 \\ | \\ \text{CH}_3 - \text{C} - \text{CH}_2 - \text{CH}_3 \\ | \\ \text{CH}_3 \end{array}$$
- is
- a) 2-ethyl-2-methyl propane
b) 2, 2-demethyl butane
c) 1,1,1-trimethyl propane
d) 2, 2-methyl butane
8. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?
- a) Starch breaking down into sugars.
b) Proteins breaking down into amino acids.
c) Absorption of vitamins.
d) Fats breaking down into fatty acids and glycerol.
9. Which of the following endocrine glands does not exist in pairs?
- a) Testes b) Adrenal
c) Pituitary d) Ovary

10. Along the path of the vas-deferens the secretions of which gland provide nutrition to the sperms?
- Prostate glands
 - Seminal vesicles
 - Scrotum
 - Urinary bladder
11. The enzymes pepsin and trypsin are secreted respectively by
- Stomach and pancreas
 - Salivary gland and stom
 - Liver and pancreas
 - Liver and salivary gland
12. Which one is a possible progeny in F_2 generation of pure bred tall plant with round seed and short plant with wrinkled seeds?
- Tall plant with round seeds
 - Tall plant with wrinkled seeds
 - Short plant with round seed
 - All of the above

13. A student does the experiment on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He can get a correct measure of the angle of incidence and the angle of emergence by following the labelling indicated in figure:



- I
 - II
 - III
 - IV
14. The image shows a light ray incident on a glass prism.



The various angles are labeled in the image. Which angle shows the angle of incidence and angle of refraction, respectively?

- A and D
 - B and E
 - C and F
 - D and F
15. Which of the following constitute the food chain?
- grass, wheat and mango
 - grass, goat and human
 - goat, cow and elephant
 - grass, fish, goat
16. In food web, flow of energy is :
- Non directional
 - Bidirectional
 - Unidirectional
 - any of above

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

- Both A and R are true, and R is the correct explanation of A.
 - Both A and R are true, and R is not the correct explanation of A.
 - A is true but R is false.
 - A is false but R is true.
17. **Assertion(A)** : Soaps are not suitable for washing purpose when water is hard.
Reason (R) : Soaps have relatively weak cleansing action.
18. **Assertion(A)**: A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus.
Reason (R) : Different sense organs have different receptors for detecting stimuli.
19. **Assertion (A)** : The resistivity of a substance does not depend on the nature of the substance and temperature.
Reason (R) : The resistivity of a substance is a characteristic property of the material.
20. **Assertion(A)**: Accumulation of harm ful

chemicals is higher in case of organisms at higher trophic level.

Reason(R): Food chain normally can't reduce beyond 3 or 4 trophic level.

Section-B(Each 2 marks)

Question No. 21 to 26 are very short answer questions

21. Study the following equation of a chemical reaction:
$$\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$$
- Identify the type of reaction.
 - Write a balanced chemical equation of another example of this type of reaction.
- 22.
- Name the hormones that are released in human males and females when they reach puberty.
 - Name a gland associated with brain. Which problem is caused due to the deficiency of the hormone released by this gland?
23. Give reasons:
- Ventricles have thicker muscular walls than atria.
 - Transport system in plants is slow.

OR

Draw a diagram of human excretory system and label kidneys, ureters on it.

24. Alloys are used in electrical heating devices rather than pure metals. Give reason.
25. Show how would you join three resistors, each of resistance 9Ω so that the equivalent resistance of the combination is (i) 13.5Ω , (ii) 6Ω

OR

Two identical resistors are first connected in series and then in parallel. Find the ratio of equivalent resistance in two cases.

26. What is a solenoid? Draw magnetic field lines showing the magnetic field inside and outside the current carrying solenoid?

Section-C(Each 3 Marks)

Question No. 27 to 33 are short answer questions

27. A compound X has the molecular formula $\text{C}_3\text{H}_6\text{O}$ with structural formula $\text{CH}_3\text{CH}_2\text{O}$. Give its IUPAC name. Can another compound have the same molecular formula? Give the structure and IUPAC name of that compound also.
- 28.
- Write two properties of gold which make it the most suitable metal for ornaments.
 - Name two metals which are the best conductors of heat.
 - Name two metals which melt when you keep them on your palm.
 - Explain the formation of ionic compound CaO with electron-dot structure. Atomic numbers of calcium and oxygen are 20 and 8 respectively.

OR

A metal 'M' is found in nature as its carbonate. It is used in the galvanization of iron. Identify 'M' and name its ore. How will you convert this ore into free metal?

29. Study the given data and answer the questions following the data: Parental plants cross fertilised and seeds collected
- | Generation | Offspring | Phenotype | Number of seeds |
|------------------|-----------|---------------|-----------------|
| Parental | Male | Red flowers | 330 |
| Parental | Female | White flowers | 330 |
| First Generation | Offspring | Red flowers | 44 |
| First Generation | Offspring | White flowers | 11 |

- What is the term for this type of cross?
 - What does the data of the column marked F indicate?
 - Express the gene type of the (a) parents (b) F_1 progeny and (c) F_2 progeny
30. Why and how does water enter continuously into the root xylem of plants?

31. Calculate the magnification of the image of an object placed perpendicular to the principal axis of a concave mirror of focal length 15 cm.

The object is at a distance of 20 cm from the mirror.

32. a) List two causes of hypermetropia.
b) Draw ray diagrams showing (i) a hypermetropic eye and (ii) its correction using suitable optical device.
33. Draw magnetic field lines produced around a current carrying straight conductor passing through cardboard.
How will the strength of the magnetic field change, when the point where magnetic field is to be determined, is moved away from the straight wire carrying constant current? Justify your answer.

Section-D (Each 5 Marks)

Question No. 34 to 36 are long answer questions.

34. Write the chemical name of $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ and Na_2CO_3 . Write the significance of $10\text{H}_2\text{O}$. Mention the term used for water molecules attached with a salt. With the help of chemical equation, explain the method of preparation of both $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ and Na_2CO_3 . Also list two uses of $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

OR

Identify the type of chemical reactions in the following processes:

- Barium chloride solution is mixed with copper sulphate and a white precipitate is formed.
- On heating copper powder in a china dish, the surface of copper powder becomes black.
- On heating green ferrous sulphate crystals, reddish brown solid is left as residue and a gas having smell of burning sulphur is evolved.
- Iron nails when left dipped in blue copper sulphate solution become brownish in colour and blue colour of copper sulphate solution fades away.

- v) Quicklime reacts vigorously with water releasing large amount of heat.

35. a) Draw a diagram of human alimentary canal and label the following parts:
i) Largest gland.
ii) Gland that secretes digestive enzymes and hormone.
iii) Part where HCl is produced.
iv) Part where digested food is absorbed.
b) What are villi? Explain their function in the digestive system.

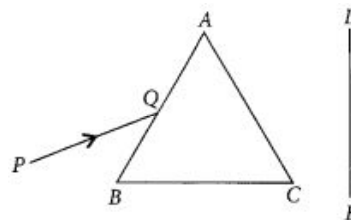
OR

Describe the structure and functioning of nephrons.

36. Describe the structure and functioning (a) To construct a ray diagram we use two rays which are so chosen that it is easy to know their directions after reflection from the mirror. Use these two rays and draw ray diagram to locate the image of an object placed between pole and focus of a concave mirror.
b) A concave mirror produces three times magnified image on a screen. If the objects placed 20 cm in front of the mirror, how far is the screen from the object?

OR

A narrow PQ of white light is passing through a glass prism ABC as shown in the diagram. Trace it on your answer sheet and show the path of the emergent beam as observed on the screen DE.



- Write the name and cause of the phenomenon observed.
- Where else in nature is this phenomenon observed?
- Based on this observation, state the conclusion which can be drawn about the constituents of white light.

SECTION - E(Each 4 marks)

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. Read the following paragraph and answer the following question

Most dirt is oily in nature and as you know, oil does not dissolve in water. The molecules of soap are sodium or potassium salts of long-chain carboxylic acids. The ionic-end of soap interacts with water while the carbon chain interacts with oil. The soap molecules, thus form structures called micelles, where one end of the molecules is towards the oil droplet while the ionic-end faces outside. This forms an emulsion in water. The soap micelle thus helps in pulling out the dirt in water and we can wash our clothes clean

- i. What is hydrophobic end? 1
- ii. Draw the structure of micelle. 1
- iii. What is hard water? 2

OR

To remove hardness of water, the water is treated with soap or detergent?

38. Read the following paragraph and answer the following question

When a girl is born, the ovaries already contain thousands of immature eggs. On reaching puberty, some of these start maturing. One egg is produced every month by one of the ovaries. The egg is carried from the ovary to the womb through a thin oviduct or fallopian tube. The two oviducts unite into an elastic bag-like structure known as the uterus. The uterus opens into the vagina through the cervix.

- i) What is fertilization? 2

OR

What is placenta?

- ii) What are the different parts of female reproductive system? 1

- iii) What happens when egg is not fertilized? 1

39. Read the following paragraph and answer the following question

There are various natural phenomenon associated with light. Refraction of light is the phenomenon in which when light travels from one transparent medium to another transparent medium it changes its direction. The change in direction of light is due to the change in velocity of light in different media. And hence the path of the light also changes in different media. In case of refraction of light through rectangular glass slab we must observe that the incident ray and the emergent ray are parallel to each other.

We can see the pencil immersed in water as bent at the water air interface only because of the refraction of light. A second phenomenon is dispersion of light in which white light when passed through the prism it splits into seven coloured spectrum. And these seven colours are VIBGYOR. We can see here the angle of deviation is different for different colour because different wavelengths of different colour. Also, Newton observed that when second prism is placed inverted to first prism the white light incident on the first prism will come out as white light only when emerges out from second prism. The phenomenon of formation of rainbow is also because of the dispersion of light. In that case the tiny water droplets acts as prism.

But most importantly, the refraction of light occurs only because of the change in refractive index of medium. The twinkling of stars is due to the atmospheric refraction of light.

- i) Rainbow formation takes place because of which phenomenon related to light? 1
- ii) What is meant by total internal reflection? 1
- iii) Why atmospheric refraction occurs? 2

OR

For which colour the angle of deviation is more in case of dispersion?

* * *