विद्या सर्वार्थि साधिका

ANANDALAYA
PRE-BOARD EXAMINATION
Class : X

Subject: Science (086) MM :80
Date :27-01-2023 Time: 3 hours

General Instructions:

i. This question paper consists of 39 questions in 5 sections.
ii. All the questions are compulsory. However, internal choice is provided in certain questions. A student is expected to attempt only one of these questions.
iii. Section A consists of 20 Objective type questions carrying 01 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 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 one most appropriate option out of four options given for each question 1-20

1. Calcium phosphate is present in tooth enamel. Its nature is _____. (1)
(A) Acidic (B) Basic (C) Amphoteric (D) Neutral

2. Which of the following gases can be used for storage of fresh samples of oil for a long time? (1)
(A) Carbon dioxide or oxygen (B) Nitrogen or oxygen
(C) Carbon dioxide or helium (D) Helium or nitrogen

3. What happens when dilute sulphuric acid is poured on a copper plate? (1)
(A) No reaction takes place (B) Copper chloride formed
(C) Zinc sulphate formed (D) Copper sulphate formed

4. The general formula of cycloalkanes is _____. (1)
(A) C_nH_{2n+2} (B) C_nH_{2n-2} (C) C_nH_{2n-1} (D) C_nH_{2n}

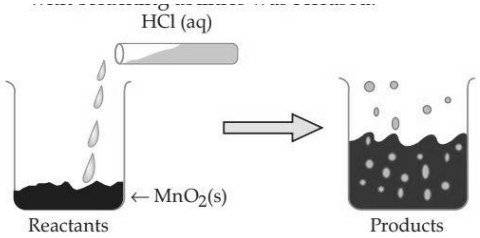
5. As the pH value of solution increases from 7 to 14, it represents _____. (1)
(A) a decrease on the concentration of OH^- ions
(B) an increase in the concentration in OH^- ion
(C) no change in the concentration of OH^- ions
(D) an increase in the concentration of H_3O^+ ions.

6. Match the following with the correct response: (1)

(i) Soap	(a) Sodium salts of long-chain of sulphonic acids
(ii) Detergents	(b) Esterification
(iii) The reaction of CH_3COOH with metal hydroxides	(c) Neutralization
(iv) The reaction of CH_3COOH with alcohols	(d) Sodium salts of long-chain fatty acids

(A) (i) - (c), (ii) - (b), (iii) - (d), (iv) - (a) (B) (i) - (a), (ii) - (c), (iii) - (b), (iv) - (d)
(C) (i) - (d). (ii) - (a), (iii) - (c), (iv) - (b) (D) (i) - (b), (ii) - (d), (iii) - (a), (iv) - (c)

7. The reaction between MnO_2 with HCl is depicted in the following diagram. It was observed that a gas with bleaching abilities was released. (1)



What is the gas which is coming out from the beaker at product side?

(A) $HCl_{(g)}$ (B) Cl_2 (C) $H_2O_{(g)}$ (D) $MnCl_{2(g)}$

8. The small intestine in a deer is longer as compared to the small intestine of a tiger. The reason for this is _____. (1)

(A) Mode of intake of food (B) Type of food consumed
(C) Absence of villi in the intestine (D) Absence of certain digestive enzymes

9. In a synapse, chemical signal is transmitted from _____. (1)

(A) dendritic end of one neuron to axonal end of another neuron
(B) axon to cell body of the same neuron
(C) cell body to axonal end of the same neuron
(D) axonal end of one neuron to dendritic end of another neuron

10. The correct sequence of reproductive process seen in flowering plants is_____. (1)

(A) gamete, zygote, embryo, seedling (B) zygote, gamete, embryo, seedling
(C) seedling, embryo, zygote, gamete (D) gamete, embryo, zygote, seedling

11. Study the given cross showing self pollination in F_1. (1)

P	RRYY	X	rryy
	Round Yellow		Wrinkled green
F_1	RrYy	X	_____
	Round Yellow		

The missing blank in the above cross is _____

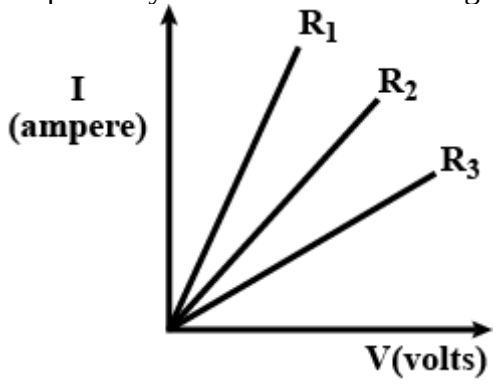
(A) RrYy (B) RRYY (C) RryY (D) rryy

12. Excessive exposure of human beings to UV rays results in_____ (1)

i. Change in immune system
ii. Damage to lungs
iii. Skin cancer
iv. Peptic ulcer

(A) i and ii (B) ii and iv
(C) i and iii (D) iii and iv

13. A student carries out an experiment and plots the V-I graphs of three samples of nichrome wire with resistances R_1, R_2, and R_3 respectively. Which of the following is true? (1)



(A) $R_1 = R_2 = R_3$ (B) $R_1 > R_2 > R_3$ (C) $R_1 < R_2 < R_3$ (D) $R_2 > R_3 > R_1$

14. A compass needle will point _____ when placed just above a wire in which electrons are moving towards south. (1)
(A) east (B) west (C) north (D) south

15. Unit of electric power may also be expressed as: (1)
(A) volt ampere (B) kilowatt hour (C) watt second (D) joule second

16. Magnetic field lines determine (1)
(A) the shape of the magnetic field.
(B) only the relative strength of the magnetic field.
(C) only the direction of the magnetic field
(D) both the direction and the relative strength of the magnetic field.

Q. no 17 to 20 are Assertion – Reasoning based questions.
These consist of two statements — Assertion (A) 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 the A.
(B) Both A and R are true, but R is not the correct explanation of the A.
(C) A is true, but R is false.
(D) A is false but R is true.
(E) A and R both false

17. **Assertion:** The Nature of Na_2CO_3 salt is acidic. (1)
Reason: Na_2CO_3 is a salt of Strong acid and strong base

18. **Assertion**: HCl converts pepsinogen into active enzyme pepsin. (1)
Reason: Pepsin converts protein into simple proteose and peptones.

19. **Assertion:** Traits like eye colour and height are inherited traits. (1)
Reason: Inherited traits are not transferred from parents to off-springs.

20. **Assertion:** When a compass needle is moved away from a current-carrying straight conductor, the deflection of the needle decreases. (1)
Reason: The strength of the magnetic field decreases on moving away from the straight conductor.

SECTION – B

Q. No. 21 to 26 are very short answer questions

21. a) Translate the following statement into a balanced chemical equation. (2)
Hydrogen sulphide gas burns in air to give water and sulphur dioxide
b) Balance the following chemical reaction.

$$Al + CuCl_2 \text{ ----------> } AlCl_3 + Cu$$

OR

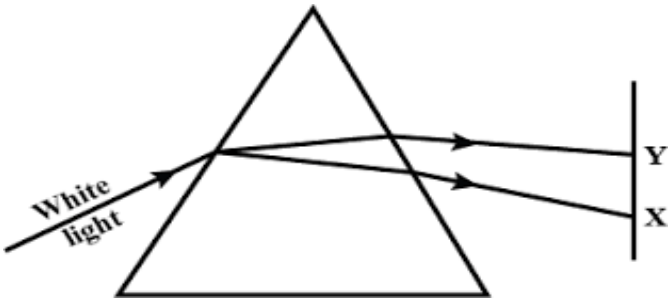
Explain the change in pH during the chlor-alkali process.

22. Mention any two functions performed by pancreas in our body. (2)

23. Name the parts of the brain that performs the following functions: (2)
i. Maintaining posture and balance of our body.
ii. Regulation blood pressure
iii. Sensation of hunger or feeling full
iv. Seeing

24. Rajesh observed a patch of greenish black powdery substance on a stale piece of bread. (2)
i. Name the organism responsible for this and its specific mode of asexual reproduction.
ii. Name its vegetative and reproductive parts.

25. (2)



State the phenomena observed in the above diagram. Explain with reference to the diagram, which of the two lights (yellow and blue) mentioned above will have the higher wavelength?

OR

How will you use two identical prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw the diagram.

26. DDT was sprayed in a lake to regulate breeding of mosquitoes. How would it affect the trophic levels in the following food chain associated with a lake? Justify your answer. (2)
Phytoplankton → Small fish → Large fish → Hawk

SECTION – C

Q. no. 27 to 33 are short questions.

27. a) A substance X, which is an oxide of a group 2 element, is used intensively in the cement industry. This element is present in bones also. On treatment with water, it forms a solution which turns pink when phenolphthalein is added to it. Identify X and also write a chemical reaction involved. (3)

b) Define: Isomerism

28. a) Account for the following: Carbon cannot reduce the oxides of Na and Mg. (3)
b) (i) Represent the chemical reaction in the form of an equation taking place during the chlor-alkali process.
(ii) What are the products at cathode and anode during this process?

29. Draw the diagram of the longitudinal section of a bisexual flower and label the following parts. (3)
(a) Ovary. (b) Male germ cell (c) Pollen tube (d) Female germ cell

OR

Draw the diagram of sectional view of human male reproductive system and label the following parts.
(a) Testis (b) Scrotum (c) Vas deferens (d) Prostate gland

30. (a) Give an example each when (i) a parallel beam of light and (ii) a diverging beam of light are obtained using a spherical mirror. (3)
(b) What type of mirror is it and what type image is formed is formed the above spherical mirror?
(c) Draw a ray diagram using the above rays to form an image on the above spherical mirror.

31. (a) A man with normal near point (25cm) reads a book with small print using a magnifying glass: a thin convex lens of focal length 5cm. What are closest and the farthest distances at which he can read the book when viewing through the magnifying glass? (3)
(b) A person with myopic eyes cannot see objects beyond 1.2 m distinctly. What should be power of the lens he needs to wear?

32. (a) Draw a diagram representing the magnetic field inside and outside a solenoid through which a current is flowing and mark with arrows, the direction of the current in the solenoid and the direction of the magnetic lines of force. Also mark the polarity at the faces of the solenoid. (3)
(b) Why is it that if a current carrying coil has n turns the field produced at any point is n times as large as that produced by a single turn?

OR

(a) Draw an appropriate schematic diagram showing common domestic circuits.
(b) Why is it that a burnt out fuse should be replaced by another fuse of identical rating?

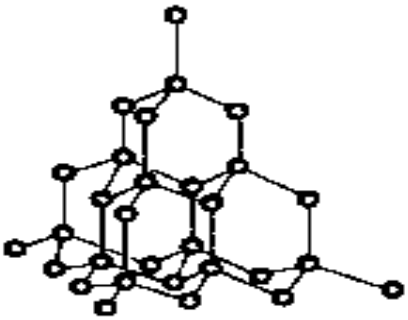
33. (a) Which are the two types of transport systems in human beings? (3)
(b) How are their functions complimentary to each other?
(c) How are the fluids of these systems connected?

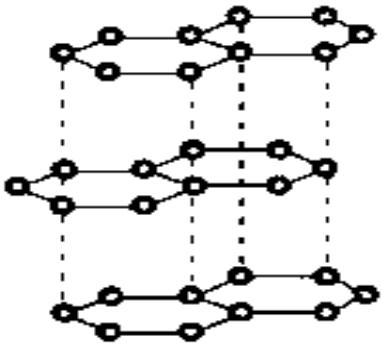
SECTION – D

Q.no. 34 to 36 are long answer questions.

34 a) Justify the statement by taking an appropriate example: 'The chemical properties of all the members of the same homologous series are almost identical'. (5)

b) The following is a figure representing the allotropes of carbon.





Which allotrope of carbon is a good conductor of electricity and why?

c) What is the next higher homologue of C_3H_7OH? What is its formula?

OR

a) Name the metal which does not stick to glass?

b) Name the metal which is commonly used in thermit welding?

c) What is the nature of ZnO? Acidic, basic or Amphoteric?

d) Represent a chemical reaction of esterification between Ethanol and Propanoic acid?

e) How will you distinguish Butane and Butene?

35. (a) State the law of segregation. Explain with an example. (5)
(b) Why are the traits acquired during the life time of an organism not inherited? Explain.

OR

(a) Why did Mendel select Garden Pea for his experiments? Write two reasons.
(b) List two contrasting visible characters of garden pea Mendel used for his experiments.
(c) Explain in brief, how Mendel interpreted his results to show that the traits may be dominant or recessive.

36. (a) Why does a current carrying conductor kept in a magnetic field experience force? (5)
(b) On what factors does the direction of this force depend?
(c) Name and state the rule used for determination of the direction of this force.
(d) In which direction does an electron travelling horizontally towards east and a magnetic field acting vertically downward direction exerts a force on?
(e) On what type of particle magnetic field exerts a force?

SECTION – E

Q.no.37 to 39 are case – based/data based questions with 2 or 3 short sub –parts. Internal choice is provided in one of this sub – parts.

37. During extraction of metals, electrolytic refining is used to obtain pure metals. During the process, the impure metal is made the anode and a thin strip of pure metal is made the cathode. The solution of the metal salt is used as an electrolyte. On passing the current through the electrolyte, the pure metal from the anode dissolves from the electrolyte. An equivalent of pure metal from the electrolyte is deposited on the cathode. (4)

(i) The process of purification of the metal obtained after reduction, is called:
(A) Extraction (B) Refining (C) Froth floatation (D) Electrolysis

(ii) Which of the metals are refined by electrolytic refining?

(i) Au (ii) Cu (iii) Na (iv) K

(A) (i) and (ii) (B) (i) and (iii) (C) (ii) and (iii) (D) (ii) and (iv)

(iii) During electrolytic refining of zinc, it gets _____

(A) deposited on cathode. (B) deposited on anode.

(C) deposited on cathode as well as anode. (D) remains in the solution.

(iv) Define: Anode mud

OR

(iv) What is the correct name for Fe_2O_3?

38. In the following case based question attempt any four sub parts. (4)

In a cross between plants with purple flowers and plants with white flowers all the off-springs of F_1 generation had white flowers. When F_1 generation was selfed, it was observed in F_2 that out of 100, 75 flowers were white. Solve this cross and answer the following questions.

(i) The above cross is known as __

(A) Monohybrid cross (B) Dibybrid cross (C) Test cross (D) Back cross

(ii) In a monohybrid cross between two heterozygous individuals, percentage of pure homozygous individuals obtained in F1 generation is ___

(A) 25% (B) 50% (C) 75% (D) 100%

(iii) Which of these is not the genotype of F2 progeny?

(A) WW (B) Ww (C) ww (D) WP

(iv) The ratio of "white: purple" flowers in the F_2 generation is:

(A) 3:1 (B) 1:2 (C) 1:3 (D) 2:1

39. (4)

The above images are that of specialized slide projector. Slides are small transparencies mounted in sturdy frames ideally suited to magnification and projection, since they have a very high resolution and a high image quality. There is a tray where the slides are to be put into a particular orientation so that the viewers can see the enlarged images of the transparent slides. The slides will have to be inserted upside down in the projector tray.

To show her students the images of insects that she investigated in the lab, Mrs. Vinitha brought a slide projector. Her slide projector produced a 500 times enlarged and inverted image of a slide on a screen 10 m away.

(a) Based on the text and data given in the above paragraph, Why the slides have to be inserted upside down?

(b) If v is the symbol used for image distance and u for the object distance then with one reason state what will be the sign for v/u in the given case?

(c) A slide projector has a convex lens with a focal length of 20 cm. The slide is placed upside down 21 cm from the lens. How far away should the screen be placed from the slide projector's lens so that the slide is in focus?

OR

(c) When a slide is placed 15 cm behind the lens in the projector, an image is formed 3 m in front of the lens. If the focal length of the lens is 14 cm, draw a ray diagram to show image formation (not to scale)