Sample Paper

3

Time : 90 Minutes **Max. Marks : 40**

General Instructions

1. *The Question Paper contains three sections.*
2. *Section A has **24** questions. Attempt any **20** questions.*
3. *Section B has **24** questions. Attempt any **20** questions.*
4. *Section C has **12** questions. Attempt any **10** questions.*
5. *All questions carry equal marks.*
6. *There is no negative marking.*

SECTION-A

*Section – A consists of 24 questions. Attempt **any 20** questions from this section. The first attempted 20 questions would be evaluated.*

1. Anshul studied the position of metals in reactivity series. He noted down few points. Which of the following points is incorrect?

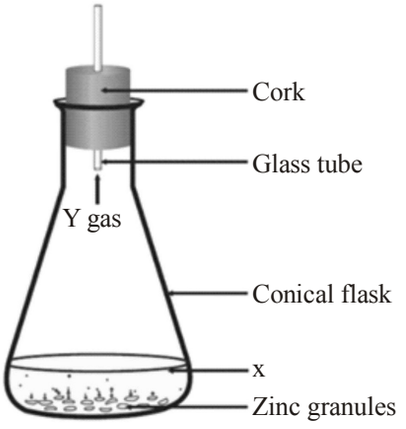
(a) Metals present at the bottom of the series are found in native state.

(b) Metals present at the lower region of reactivity series can be obtained by heating their oxide only.

(c) Metals present at the middle of the reactivity series can be displaced by using metals below them.

(d) None of these.

2. Zinc granules on treating with an acid X, form the zinc sulphate ($ZnSO_4$) salt along with the evolution of a gas Y which burns with a pop sound when brought near to a burning candle. Identity the acid X and gas evolved Y.



(a) X-Sulphuric acid and Y-Oxygen gas

(b) X-Hydrochloric acid and Y-Oxygen gas

(c) X-Sulphuric acid and Y-Hydrogen gas

(d) X-Hydrochloric acid and Y-Hydrogen gas

3. During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to:

(a) absorb the evolved gas. (b) moisten the gas.

(c) absorb moisture from the gas. (d) absorb Cl^- ions from the evolved gas.

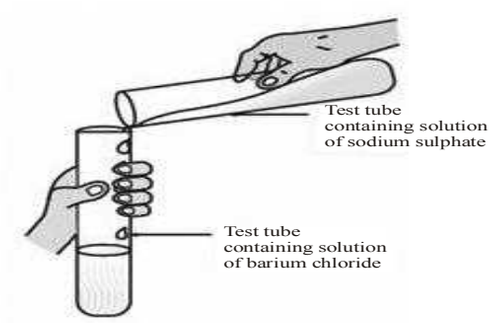
4. Consider the following elements:

(i) Platinum (ii) Gold (iii) Iron (iv) Silver

Which of the above elements exist free in nature?

(a) (i) and (ii) (b) (ii) and (iii) (c) (i), (ii) and (iv) (d) (iii) and (iv)

5. Which of the following correctly represents the type of the reaction involved in the figure:



(i) Displacement reaction (ii) Precipitation reaction

(iii) Combination reaction (iv) Double displacement reaction

(a) (i) only (b) (ii) only (c) (iv) only (d) (ii) and (iv)

6. To protect tooth decay we are advised to brush our teeth regularly. The nature of the tooth paste commonly used is:

(a) Acidic (b) Neutral (c) Basic (d) Corrosive

7. Which of the following is not a characteristics of metal ?

(a) Malleable (b) Electropositive nature (c) Ductile (d) None of these

8. Which among the following statement(s) is(are) true? Exposure of silver chloride to sunlight for a long duration turns grey due to

(i) the formation of silver by decomposition of silver chloride

(ii) sublimation of silver chloride

(iii) decomposition of chlorine gas from silver chloride

(iv) oxidation of silver chloride

(a) (i) only (b) (i) and (iii) (c) (ii) and (iii) (d) (iv) only

9. Which of the following is incorrect match.

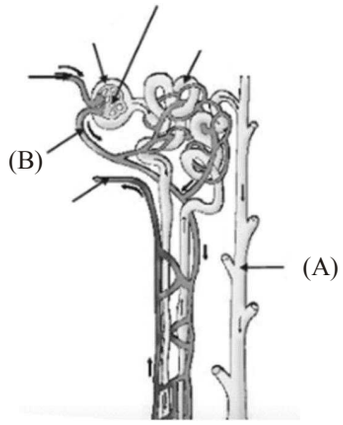
	Basic Compounds	**Properties**
(A)	$NaHCO_3$	Baking soda. Alkaline, Acidic Salt
(B)	NaOH	Alkali, Bitter, Corrosive
(C)	$KHSO_4$	Acidic salt
(D)	$Al(OH)_3$	Alkali, Strong base

(a) A (b) B (c) C (d) D

10. Which of the following elements will form basic oxides?

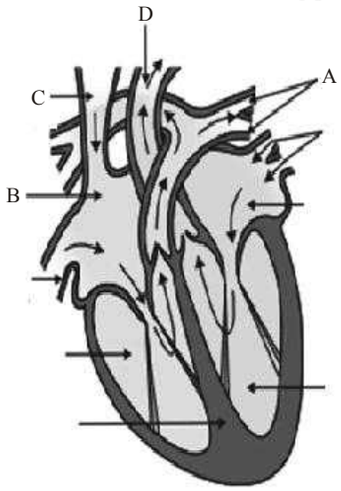
(a) Barium (b) Aluminium (c) Carbon (d) Phosphorus

11. In the given diagram, identify the part of collecting duct and renal artery.



(a) A & B (b) C & D (c) A & D (d) B & D

12. The given diagram is labelled as A, B, C and D. Which of the following portion represents Aorta.

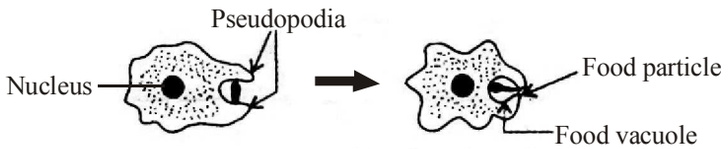


(a) A (b) B (c) D (d) C

13. The kidneys of the human being play important role in the process of

(a) transportation (b) nutrition (c) respiration (d) excretion

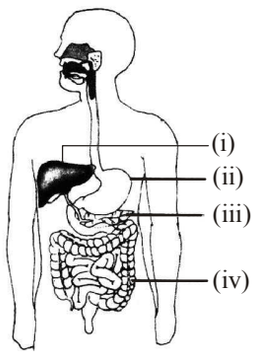
14. If nucleus is removed from *Amoeba*



(a) Dies immediately (b) Remaince alive

(c) from pseudopodia (d) does not grow and dies ultimately

15. Observe the diagram of human digestive system. The labelling B represents the



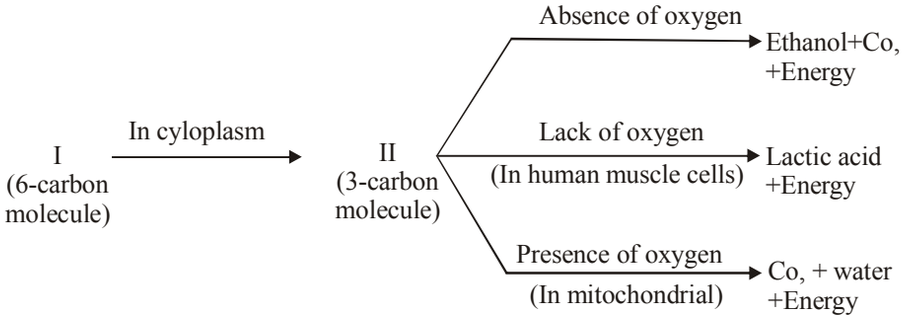
Match the labelling referred in column I and co-relate with the scretory product in column II

Column I		Column II
(i)	A -	Bile
(ii)	B -	HCL
(iii)	C -	Pancreatic juice
(iv)	D -	Intestinal juice

(a) (i) – A, (ii) – B, (iii) – C, (iv) – D (b) (i) – C, (ii) – B, (iii) – A, (iv) – D

(c) (i) – D, (ii) – C, (iii) – B, (iv) – A (d) (i) – C, (ii) – D, (iii) – A, (iv) – B

16. In the given diagram, labelling I and II represents respectively



(a) Labelling I represents the pyruvate (b) Labelling II indicates the glucose

(c) Both Labelling I & II shows glucose (d) Labelling II represents the pyruvate

17. In case of erect object having inverted image, linear magnification is :

(a) positive (b) negative (c) zero (d) no definite sign.

18. An object is situated at a distance of $f/2$ from a convex lens of focal length f. Distance of image will be –

(a) $+(f/2)$ (b) $+(f/3)$ (c) $+(f/4)$ (d) $-f$

19. A concave spherical mirror has a radius of curvature of 100 cm. What is its focal length

(a) 50 cm (b) 100 cm (c) 200 cm (d) 300 cm

20. A diver in a swimming pool wants to send a signal to a person lying on the edge of the pool by flashing his water-proof torch

(a) He must direct the beam of light vertically upwards

(b) He must direct the beam horizontally

(c) He must direct the beam at an angle to the vertical which is slightly lesser than the critical angle

(d) He must direct the beam at an angle to the vertical which is slightly greater than the critical angle

21. A convex mirror is used

(a) by a dentist (b) for shaving

(c) as a rear view mirror in vehicles (d) as a light reflector for obtaining a parallel beam of light.

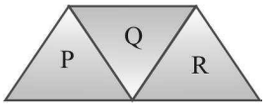
22. In case of a concave mirror, when the object is situated at the principal focus, the image formed is

(a) real and inverted (b) of infinite size (c) lies at infinity (d) all of these

23. For an object at infinity, a concave mirror produces an image at its focus which is

(a) enlarged (b) virtual (c) erect (d) real and point sized

24. A given ray of light suffers minimum deviation in an equilateral prism P. Additional prisms Q and R of identical shape and material are now added to P as shown in the figure. The ray will suffer

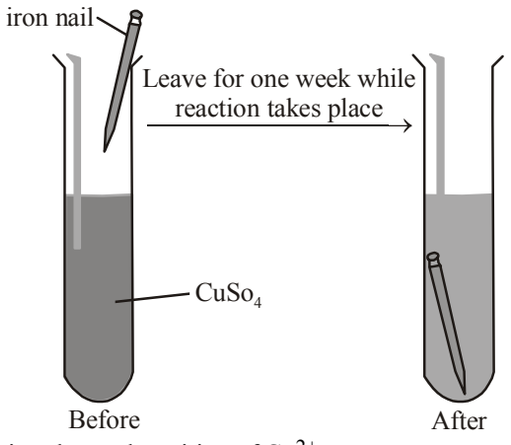


(a) greater deviation (b) same deviation (c) no deviation (d) total internal reflection

SECTION-B

*Section – B consists of 24 questions (Sl. No.25 to 48). Attempt **any 20** questions from this section. The first attempted 20 questions would be evaluated.*

25. Which of the following observation is correct for the given experiment



(A) Iron nail developes a brown coating due to deposition of Cu^{2+}.
(B) The colour of the solution becomes greenish because of the formation Fe^{2+}.
(C) Iron can displace copper.
(D) This is a double displacement reaction.

(a) (A), (B) and (C) (b) (A), (C) and (D) (c) (A) and (C) (d) (C) and (D)

26. Which of the following is incorrect?

(a) KNO_3 is a salt of potassium hydroxide and nitric acid.
(b) $AgNO_3$ is a salt of nitric acid and silver hydroxide.
(c) $MgCl_2$ is a salt of magnesium hydroxide and hydrochloric acid.
(d) $(NH_4)_2CO_3$ is a salt of ammonia and acetic acid.

27. Which of the following is correctly matched.

(a)	CaO	Amphoteric oxide
(b)	Al_2O_3	Amphoteric oxide
(c)	SO_2	Basic oxide
(d)	H_2O	Basic oxide

28. In which of the following the identity of initial substance remains unchanged?

(a) Curdling of milk (b) Formation of crystals by process of crystallisation
(c) Fermentation of grapes (d) Digestion of food

29. The basic salt, $Cu(OH)NO_3$ can be readily prepared by the reaction between

(a) $CuCl_2 + HCl$ (b) $CuOH + HNO_3$ (c) $Cu(OH)_2 + HNO_3$ (d) $Cu(NO_3)_2 + OH^-$

30. Food cans are coated with tin and not with zinc because

(a) zinc is costlier than tin. (b) zinc has higher melting point than tin.
(c) zinc is more reactive than tin. (d) zinc is less reactive than tin.

Question No. 31 to 35 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.

31. **Assertion:** When a mixture of hydrogen and chlorine is placed in sunlight, hydrogen chloride is formed.
Reason : It is an example of combination reaction.

32. **Assertion :** All alkalis are bases but all bases are not alkali.
Reason : Water soluble bases are alkali.

33. **Assertion:** Blood of insects is colourless.
Reason: The blood of insect does not play any role in transport of oxygen.

34. **Assertion:** Rainbow is an example of the dispersion of sunlight by the water droplets.
Reason: Light of shorter wavelength is scattered much more than light of larger wavelength.

35. **Assertion:** Metals are electropositive elements.
Reason: Metals form positive ions by losing electrons.

36. Open circulatory system is found in:
(a) Prawn (b) Snakes (c) Fish (d) Man

37. Removal of the pancreas impairs the breakdown of
(a) lipids and carbohydrates only (b) lipids and proteins only
(c) lipids, proteins and carbohydrates (d) proteins and carbohydrates only

38. Which one of the following organisms respires through the skin?
(a) Blue whale (b) Salamander (c) Platypus (d) Peacock

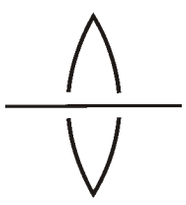
39. The reason for using red light in traffic signals to stop vehicles.
(a) Red light has shorter wavelength
(b) Red light has longer wavelength
(c) Red light is very bright and attractive
(d) Red light has highest angle of refraction

40. An object is placed 60 cm in front of a convex mirror. The virtual image formed by the mirror is located 30 cm behind the mirror. What is the object's magnification
(a) +2 (b) –2 (c) +0.5 (d) –0.5

41. Which one of the following metabolic conversions requires oxygen?
(a) Glucose to pyruvate (b) Glucose to CO_2 and ethanol
(c) Glucose to lactate (d) Glucose to CO_2 and H_2O

42. Which one of the following animals has two separate circulatory pathways?
(a) Lizard (b) Whale (c) Shark (d) Frog

43. A convex lens of focal length 20 cm is cut into two halves. Each of which is placed 0.5 mm and a point object placed at a distance of 30 cm from the lens as shown.
Then the image is at



(a) 60 cm (b) 30 cm (c) 70 cm (d) 50 cm

44. There is an equiconvex lens of focal length of 20 cm. If the lens is cut into two equal parts perpendicular to the principle axis, the focal lengths of each part will be
(a) 20 cm (b) 10 cm (c) 40 cm (d) 15 cm

45. An object is placed 20.0 cm in front of a concave mirror whose focal length is 25.0 cm. Where is the image located?

(a) 1.0×10^2 cm in front of the mirror (b) 1.0×10^2 cm behind the mirror

(c) 5.0×10^1 cm in front of the mirror (d) 5.0×10^1 cm behind the mirror

46. On the basis of experiment 'to trace the path of a ray of light passing through a rectangular glass slab' four students arrived at the following interpretations :

I. Angle of incidence is greater than the angle of emergence.

II. Angle of emergence is less than the angle of refraction.

III. Emergent ray is parallel to the incident ray.

IV. Emergent ray is parallel to the refracted ray.

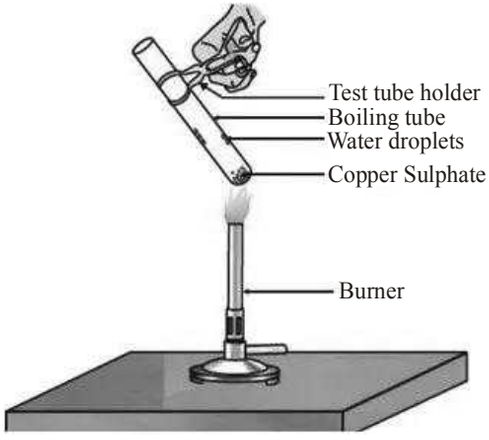
The correct interpretation is that of the student.

(a) I (b) II (c) III (d) IV

47. The linear magnification for a mirror is the ratio of the size of the image to the size of the object, and is denoted by m. Then, m is equal to (symbols have their usual meanings):

(a) $\frac{f}{f-u}$ (b) $\frac{f-u}{f}$ (c) $\frac{f}{f+v}$ (d) $\frac{f+v}{f}$

48. On heating crystals of copper sulphate pentahydrate, its colour changes from _____ to _____. This reaction is _____ and _____.



(a) Blue, green, endothermic, reversible. (b) Blue, white, exothermic, reversible

(c) Blue, white, endothermic, reversible (d) Blue, white, exothermic, irreversible

SECTION-C

Section – C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section. The first attempted 10 questions would be evaluated.

Case -I

The strength of a base depends on the concentration of the hydroxyl ions present in a solution. Greater the number of hydroxyl ion present, greater is the strength of base. However some bases do not dissociate to any appreciable extent in water, e.g. NH_4OH. Some bases dissolve in water to form alkali. Examples of such bases are sodium hydroxide and potassium hydroxide.

49. Which of the following is the characteristics of a base?

(a) Turns blue litmus to red. (b) Turns phenolpthalein pink from colourless.

(c) Decomposes carbonates. (d) Gives H^+ ions on dissociation.

50. Strength of base can be explained on the basis of –

(a) its concentration in solution (b) its degree of ionisation

(c) (a) and (b) both required (d) it is an inherent property of acid.

51. The acidity of barium hydroxide is -

(a) 1 (b) 2 (c) 3 (d) 4

52. Which are bases as well as alkalies?

(i) NaOH (ii) KOH (iii) $Fe(OH)_3$ (iv) $Cu(OH)_2$

(a) (i), (ii) (b) (i), (ii), (iii) (c) (i), (ii), (iv) (d) All of these

Case -II :

Transportation in Plants

Transportation system in plants is a vital process. The process involves the transportation of water and minerals to all parts of the plant for its survival. Transportation of food and water takes place separately in plants. Xylem transports water and minerals obtained from the soil. Phloem transports products of photosynthesis from the leaves where they are synthesised to other parts of plant. Transport of food through phloem takes place by a process called Translocation.

53. Which plant tissue transports water and minerals from the roots to the leaf?

(a) Xylem (b) Phloem (c) Parenchyma (d) Collenchyma

54. The loss of water in the form of vapour from the aerial parts of plants is called _____.

(a) Transpiration (b) Translocation (c) Guttation (d) None of these

55. Root pressure occurs when there is

(a) Less transpiration and more absorption (b) More transpiration and more absorption

(c) Less transpiration and less absorption (d) More transpiration and less absorption

56. Consider the following statements for stomatal apparatus. Which of the following are incorrect.

I. Guard cells are always surrounded by subsidiary cells.

II. Stomata are involved in gaseous exchange.

III. Guard cells invariably possess chloroplast and Mitochondria.

(a) I (b) II (c) III (d) I and II

Case -III

Inside a substance such as glass or water, light travels more slowly than it does in a vacuum. If c denotes the speed of light in a vacuum and v denotes its speed through some other substance, then $v = c/n$ where n is a constant called the index of refraction. To good approximation, a substance's index of refraction does not depend on the wavelength of light. For instance, when red and blue light waves enter water, they both slow down by about the same amount. More precise measurements, however, reveal that n varies with wavelength. Table presents some indices of refraction of Custon glass, for different wavelengths of visible light. A nanometer (nm) is 10^{-9} meters. In a vacuum, light travels as $c = 3.0 \times 10^8$ m/s

Table : Indices of refraction of Custon glass

Approximately colour	Wavelength in vacuum (nm)	"Indices n"
yellow	580	1.5
yellow orange	600	1.498
orange	620	1.496
orange red	640	1.494

57. Inside Custon glass

(a) Orange light travels faster than yellow light (b) Yellow light travels faster than orange light

(c) Orange and Yellow light travels equally fast (d) We cannot determine which color of light travels faster

58. For blue-green of wavelength 520 nm, the index of refraction of Custon glass is probably closest to

(a) 1.49 (b) 1.50 (c) 1.51 (d) 1.52

59. When viewed vertically a fish appears to be 4 meter below the surface of the lake. If the index of refraction of water is 1.33, then the true depth of the fish is

(a) 5.32 metres (b) 3.32 metres (c) 4.32 metres (d) 6.32 metres

60. Consider the following statements.

I. A lens focuses light

II. A prism breaks sunlight into different colors

III. Light rays entering a pond change direction at the pond's surface

Which of the phenomena happens because n varies with wavelength?

(a) only I is correct (b) only II is correct (c) only III is correct (d) All is correct.