## Sample Paper

## 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 $\mathbf{1 2}$ questions. Attempt any $\mathbf{1 0}$ 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.


Observe the number of electrons in each shell and guess the element.
(a) Metal
(b) Non-metal
(c) Metalloid
(d) Noble gas
2. A substance X is used to prepare white wash. On reaction with water it forms $\mathrm{Y} . \mathrm{X}$ and Y are
(a) $\mathrm{CaO}, \mathrm{CaCO}_{3}$
(b) $\mathrm{Ca}(\mathrm{OH})_{2}, \mathrm{CaCO}_{3}$
(c) $\mathrm{CaO}, \mathrm{Ca}(\mathrm{OH})_{2}$
(d) $\mathrm{CaSO}_{4}, \mathrm{Ca}(\mathrm{OH})_{2}$
3. Which of the following compounds sodium bicarbonate does not react with
(a) Hydrochloric acid
(b) Sulphuric acid
(c) Phenol
(d) Acetic acid
4.

|  | X | Y |
| :---: | :---: | :---: |
| (i) | 2,7 | 2,1 |
| (ii) | $2,8,8,1$ | $2,8,7$ |
| (iii) | $2,8,7$ | $2,8,1$ |
| (iv) | $2,8,2$ | $2,6,0$ |

XY will be ionic in case of
(a) (ii) and (iii)
(b) (ii) and (iv)
(c) (iii), (iii) and (iv)
(d) All of the these will be ionic.
5. Which of the following is not possible
(a) $\mathrm{Fe}+\mathrm{CuSO}_{4} \rightarrow \mathrm{FeSO}_{4}+\mathrm{Cu}$
(b) $\mathrm{CuCl}_{2}+\mathrm{Pb} \rightarrow \mathrm{PbCl}_{2}+\mathrm{Cu}$
(c) $\mathrm{BaSO}_{4}+2 \mathrm{NaCl} \rightarrow \mathrm{Na}_{2} \mathrm{SO}_{4}+\mathrm{BaCl}_{2}$
(d) None of these.
6.


Which of the following statement is incorrect?
(a) A is formed near anode.
(b) C is used in fuels, margarine, ammonia for fertilisers.
(c) B is used in water treatment.
(d) None of these statements is incorrect.
7. What will be the contribution of electrons present in $L$ shell of an element with atomic number 16 in bond formation?
(a) Will be lost.
(b) will be gained by another atom.
(c) No contribution.
(d) Reduce elements ability to form bond.
8. Choose the correct option for the following statement:

When $\mathrm{Sn}^{2+}$ changes to $\mathrm{Sn}^{4+}$ in a reaction then
(a) $\mathrm{Sn}^{2+}$ loses two electrons.
(b) $\mathrm{Sn}^{2+}$ gains two electrons.
(c) $\mathrm{Sn}^{4+}$ loses two electrons.
(d) This is an example of reduction reaction.

If A is mixed with equal amount of B the pH of the resulting solution will be
(a) 7.5
(b) 7
(c) 13
(d) 6.5
10. Which of the following statement is incorrect?
(i) Sodium forms cation by losing electrons.
(ii) Chlorine forms anion by gaining electron and become stable than chlorine atom.
(iii) Sodium and chloride ions being oppositely charged, attract each other to form coordinate bond.
(iv) Sodium chloride does not exist as molecules but aggregates of oppositely charged ion.
(a) only (ii)
(b) only (iii)
(c) (iii) and (iv)
(d) none of the statement is incorrect
11. Carefully observe the given figure. Identify the labelling $\mathrm{A}, \mathrm{B}, \mathrm{C}$ and D respectively.

(a) A-Lungs, B - Body, C - Pulmonary circuit, D - Systemic circuit
(b) A - Body, B - Pulmonary circuit, C - Lungs, D - Systemic circuit
(c) A - Lungs, B - Pulmonary circuit, C-Systemic circuit, D-Body
(d) A-Pulmonary circuit, B-Lungs, C-Body, D - Systemic circuit
12. Observe the given diagram and choose the correction sequence.


Fig. Human Respiratory System
(a) Pharynx - Common passage for food and air, Larynx - Sound production
(b) Pharynx - Sound production, Larynx - Common passage for food and air
(c) Pharynx - Carries air between larynx and the bronchi, Larynx - Provide large surface for gaseous exchange
(d) None of them
13. Select the correct statement?
(a) Heterotrophs do not synthesise their own food.
(b) Heterotrophs utilise solar energy for photosynthesis.
(c) Heterotrophs synthesise their own food.
(d) Heterotrophs are capable of converting carbon dioxide and water into carbohydrates.
14. The given diagram shows the different organs of the urinary system. Identify the correct function of the organs.

(a) Kidney - Store the urine, Ureters - Carries urine from urinary bladder to the outside of the body
(b) Kidney - Nitrogenous waste eleminate, Urethra - Carries urine from kidneys to the bladder
(c) Kidney - Nitrogenous waste eliminate, Ureters - Carry urine from kidney to the bladder
(d) None of the above
15. What does liver do to help digestion?
(a) Makes important enzyme
(b) Produce bile
(c) Neutralise stomach acid
(d) Regulates insulin
16. The following diagrams shows the measuring of blood pressure. Identify the correct sequence from Box I \& II?


| Box I | Box II |
| :---: | :--- |
| A | (i) Toppin sound first heard |
| B | (ii) No sound heard in stethoscope |
| C | (iii) Toppin sound just disappear |

(a) $\mathrm{A}-(\mathrm{i}) ; \mathrm{B}-(\mathrm{ii}) ; \mathrm{C}$-(iii)
(b) $\mathrm{A}-$ (ii); B -(iii); $\mathrm{C}-$ (i)
(c) $\mathrm{A}-(\mathrm{ii}) ; \mathrm{B}-(\mathrm{i}) ; \mathrm{C}$-(iii)
(d) $\mathrm{A}-(\mathrm{iii}) ; \mathrm{B}-(\mathrm{i}) ; \mathrm{C}$-(ii)
17. A man used a convex lens of focal length of 20 cm in his spects, the power of this lens is:
(a) +2 D
(b) $\quad-2 \mathrm{D}$
(c) +5 D
(d) $\quad-5 \mathrm{D}$
18. In case of a convex lens, what is the minimum distance between an object and its real image?
(a) 2.5 times of focal length
(b) 2 times of focal length
(c) 4 times of focal length
(d) equal to focal length
19. In figure, a ray of light undergoes refraction from medium $A$ to medium $B$. If the speed of light in medium $A$ is $v$ then the speed of light in medium $B$ will be

(a) $\sqrt{3} v$
(b) $\frac{v}{\sqrt{3}}$
(c) $2 v$
(d) $\frac{v}{2}$
20. Stars twinkle but planets do not twinkle because :
(a) Stars emit their own light but planets receive light from the stars.
(b) Stars do not form a part of solar system.
(c) Stars form a point source of light while planets are considered as a collection of a large number of point sources of light.
(d) During refraction of star light from the atmosphere, star light bends more towards the normal as compared to the planets.
21. The minimum distance between an object and its real image in a convex lens is ( $f=$ focal length of the lens)
(a) $2.5 f$
(b) $2 f$
(c) $4 f$
(d) $f$
22. A concaved lens has focal length of 15 cm . At what distance should the object from the lens be placed so that it forms an erect and virtual image at 10 cm from the lens?
(a) 30 cm
(b) 15 cm
(c) 60 cm
(d) 10 cm
23. A ray passing through which part of a lens emerges undeviated-
(a) Focus
(b) Centre of curvature
(c) Optical centre
(d) between Focus and centre of curvature
24. When the object is at distances $u_{1}$ and $u_{2}$ from a lens, a real and virtual images are formed respectively having the same magnification. The focal length of lens is:
(a) $u_{1}+\frac{u_{2}}{2}$
(b) $\frac{u_{1}-u_{2}}{2}$
(c) $\frac{u_{1}+u_{2}}{2}$
(d) $u_{1}+u_{2}$

## 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. $\quad \mathrm{X} \xrightarrow{\mathrm{O}_{2}}$ oxide of $\mathrm{X} \xrightarrow{\text { dil. } \mathrm{HCl}}$ Salt + Water

(a) Na
(b) Ca
(c) Cu
(d) Pt
26.

| S.No. | Indicator | Observation |
| :--- | :--- | :--- |
| (i) | Methyl orange | When added to a base it truns colour into yellow |
| (ii) | Phenolphtalein | When added to an acid it turns pink |
| (iii) | Red Cabbage | When added to a base it truns into green colour |

Correct observation is
(a) only (i)
(b) (i) and (ii)
(c) (ii) and (iii)
(d) (i) and (iii)
27. X and $\mathrm{Y}+\mathrm{H}_{2} \mathrm{O}(\mathrm{g}) \longrightarrow \mathrm{X}_{2} \mathrm{O}_{3}$ and $\mathrm{Y}_{3} \mathrm{O}_{4}+\mathrm{H}_{2}(\mathrm{~g})$

X and Y could be respectively
(a) Cu and Ag
(b) Pb and Al
(c) Al and Fe
(d) Al and Pb
28. Gas evolved in which of the following reactions burns with a pop sound.
(i) $\mathrm{Fe}+\mathrm{H}_{2} \mathrm{SO}_{4} \longrightarrow$
(ii) $\mathrm{Zn}+\mathrm{NaOH} \longrightarrow$
(iii) $\mathrm{Zn}+\mathrm{HCl} \longrightarrow$
(iv) $\mathrm{FeS}+\mathrm{H}_{2} \mathrm{SO}_{4} \longrightarrow$
(a) (ii) and (iii)
(b) (ii) (iii) and (iv)
(c) (i) (ii) and (iii)
(d) All of these
29. A student was given an oxide of a metal. This metal generally do not react with Hydrogen. He added solution of Dil. HCl in that oxide and report the observation. Which of the following observation is incorrect
(i) A blue green sollution is obtained
(ii) The oxide is copper oxide
(iii) Copper oxide in insoluble in Dil. HCl
(iv) Copper (ii) chloride is formed due to reaction between copper oxide and aicd
(a) (i), (ii) and (iii)
(b) (i), (ii) and (iv)
(c) (ii), (iii) and (iv)
(d) (i), (ii) and (iv)
30. $\underset{\text { Nonmetal }}{ }$ ' X ' $\underset{\text { oxygen }}{\text { insufficient }} \longrightarrow \underset{\text { of metals }}{\text { oxide }(\mathrm{Y})} \longrightarrow \begin{gathered}\text { Turn moist } \\ \text { of me litmus to red }\end{gathered}$
(a) $\mathrm{C}, \mathrm{CO}_{2}$
(b) $\mathrm{S}, \mathrm{SO}_{2}$
(c) $\mathrm{C}, \mathrm{CO}$
(d) both (a) and (b)

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 : In a reaction
$\mathrm{Zn}(\mathrm{s})+\mathrm{CuSO}_{4}(\mathrm{aq}) \longrightarrow \mathrm{ZnSO}_{4}(\mathrm{aq})+\mathrm{Cu}(\mathrm{s})$
Zn is a reductant but itself gets oxidized.
Reason : In a redox reaction, oxidant is reduced by accepting electrons and reductant is oxidized by losing electrons.
32. Assertion: Sodium hydrogencarbonate is also an ingredient in antacides

Reason: It is mild non corrosine basic salt and can neutralise acid present in stomach
33. Assertion: Chloroplast help in photosynthesis.

Reason: Mitochondria have enzymes for dark reaction.
34. Assertion : When a ray of light passes through a prism, it bends towards the thicker part of the prism.

Reason : An incident ray strikes a prism, undergoes refraction and comes out as an emergent ray.
35. Assertion: MgO has very high electrical conductivity.

Reason: It is an ionic compound.
36. The Excretory units of Annelids are:
(a) Uniferous tubule
(b) Flame cells
(c) Nephridia
(d) Malpighian tubule
37. An advantage of excreting nitrogenous wastes in the form of uric acid is that -
(a) It is less toxic and reduces water loss and the subsequent need for water.
(b) The formation of uric acid requires a great deal of energy.
(c) Uric acid is the first metabolic breakdown products of acids.
(d) Uric acid may be excreted through the lungs.
38. A column of water within xylem vessels of tall trees does not break under its weight because of:
(a) Tensile strength of water
(b) Lignification of xylem vessels
(c) Positive root pressure
(d) Dissolved sugars in water
39. An object of height 2.0 cm is placed on the principal axis of a concave mirror at a distance of 12 cm from the pole. If the image is inverted, real and 5 cm in height then location of the image and focal length of the mirror respectively are
(a) $(-30 \mathrm{~cm},+8.6 \mathrm{~cm})$
(b) $(-30 \mathrm{~cm},-8.6 \mathrm{~cm})$
(c) $(+30 \mathrm{~cm},+8.6 \mathrm{~cm})$
(d) $(+30 \mathrm{~cm},-8.6 \mathrm{~cm})$
40. 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
41. Which of the following process occur only in animals?
(a) Respiration
(b) Nutrition
(c) Nervous control
(d) Hormonal control
42. Adult human RBCs are enucleated. Which of the following statement(s) is / are most appropriate explanation for this feature?
(1) They do not need to reproduce
(2) They are somatic cells
(3) They do not metabolise
(4) All their internal space is available for oxygen transport
(a) Only (1)
(b) (1), (3) and (4)
(c) (2) and (3)
(d) Only (4)
43. A beam of light is incident at $60^{\circ}$ to a plane separating two medium. The reflected and refracted rays are found to be perpendicular to each other. What is the refractive index of the second medium with respect to the first medium ?
(a) $1 / \sqrt{3}$
(b) $1 / 3$
(c) $\sqrt{3}$
(d) 3
44. Which of the following statements are true regarding scattering of light?
I. Amount of scattering depends upon the wavelength of light.
II. Tyndal effect is observed due to scattering of light
(a) Only I is true
(b) Only II is true
(c) Both I and II is true
(d) None is true
45. "Metal dishes" (Dish Antennas) are used for receiving TV signals from distant communication satellites. These 'Metal Dishes' are
(a) Convex Reflectors
(b) both convex and concave reflectors
(c) Concave reflector
(d) Convex refractors
46. If a symmetrical convex lens of focal length ' $f$ ' is cut into two parts along the principal axis as shown in the figure, the focal length of each part will be

(a) $\mathrm{f} / 2$
(b) $\mathrm{f} / 4$
(c) f
(d) $\infty$
47. The size of image formed by a concave mirror is same as the size of object. The position of the object will be
(a) at F
(b) between F and C
(c) at C
(d) between C and infinity
48.


If we added $\mathrm{FeSO}_{4}$ to above four test tubes, in which test tube we observe no change?
(a) "A"
(b) "B"
(c) "C"
(d) "D"

## 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

pH is quite useful to us in a number of ways in daily life. Some of its applications are:
$\mathbf{p H}$ in our digestive system : our stomach produces HCl which is an acid and helps in digestion. Sometimes during indigestion stomach produces too much of acid then people used antacids to treat this problem.
$\mathbf{p H}$ of the soil : Plants need a specific pH range for proper growth. The soil may be acidic, basic or neutral depending upon the relative concentration of $\mathrm{H}^{+}$and OH -. The pH of any soil can be determined by using pH paper. If the soil is too acidic, it can be corrected by adding lime to it. If the soil is too basic, it can be corrected by adding organic manure which contains acidic materials. Regaining shine of a tarnished copper vessel by use of acids : A copper vessel gets tarnished due to formation of an oxide layer on its surface. On rubbing lemon on the vessel, the surface is cleaned and the vessel begins to shine again. This is due to the fact that copper oxide is basic in nature, which reacts with the acid (citric acid) present in lemon to form a salt (copper citrate) which is washed away with water. As a result, the layer of copper oxide is removed from the surface of the vessel and the shining surface is exposed.

Self-defence by animals through chemical warfare : Stings of bees and ants contain methanoic acid. When stung, it causes lot of pain and irritation. This can be cured by rubbing the affected area with mild base like baking soda.
49. Which of the following is not anta acid?
(i) $\mathrm{NaHCO}_{3}$
(ii) $\mathrm{Mg}(\mathrm{OH})_{2}$
(iii) $\mathrm{Cs}(\mathrm{OH})_{2}$
(iv) $\mathrm{Al}(\mathrm{OH})_{3}$
(a) only (iii)
(b) (iii) and (iv)
(c) (ii) and (iii)
(d) only (iv)
50. Sting of ant can be cured by rubbing the affected area with soap because
(a) it contains oxalic acid which neutralises the effect of formic acid
(b) it contains sodium hydroxide which neutralises the effect of formic acid
(c) it contains aluminium hydroxide which neutralises the effect of formic acid
(d) none of these
51. If soil is acidic, which of the following can be used to treat the problem?
(a) Quick lime
(b) Lime
(c) chalk
(d) all of these
52. To prevent tooth decay which of the following type of paste should be used?
(a) It should have pH less than 7
(b) It should have pH less than 5
(c) It should have pH more than 7
(d) It should have pH 7

## Case-II

There is a pair of bean-shaped organs P in the human body towards the back, just above the waist. A waste product Q formed by the decomposition of unused proteins in the liver is brought into organ P through blood by an artery R . The numerous tiny filters S present in organ P clean the dirty blood by removing the waste product Q . The clean blood goes into circulation through a vein T . The waste substance Q , other waste salts, and excess water form a yellowish liquid U which goes from organ P into a bag-like structure V through two tubes W. This liquid is then thrown out of the body through a tube X .
53. Which of the following Labelling shows renal artery and renal vein?
(a) P and W
(b) V and T
(c) X and W
(d) R and T
54. What is bag-like structure that is shown by V?
(a) Ureter
(b) Urethra
(c) Bladder
(d) None of them
55. Labelling V, W and $X$ represents respectively
(a) V-Bladder, W-Kidney, X - Urethra
(b) V - Bladder, W - Ureter, X - Urethra
(c) V-Ureter, W-Bladder, X - Renalartery
(d) None of the above
56. What is the function of oxgan $P$ ?
(a) Deomposition of unused proteins
(b) Remove the waste product from blood
(c) Add waste product in blood
(d) None of these

## Case-III

If focal length of a lens is measured in metre then its reciprocal gives the power of the lens.
Power of a lens, $P=\frac{1}{f(\text { in } m)}$
57. The focal length of convex lens is 50 cm . The power of lens is
(a) 1 D
(b) 2 D
(c) 3 D
(d) 4 D
58. Find the focal length of a lens if power of the lens is +0.4 D .
(a) 5 m
(b) 2.5 m
(c) 10 m
(d) 20 m
59. The focal length of the lens is -25 cm . Which of the following statements about the lens is true?
(I) The lens is concave
(II) The lens is convex
(III) Power of the lens is -4 D .
(a) only I is correct
(b) only II is correct
(c) only II and III is correct
(d) only I and III is correct
60. Nature of the lens whose power is $+4 D$, is
(a) Convex lens
(b) Concave lens
(c) Neither of two
(d) May be convex lens or concave lens

