Science

Sample Question Paper 1
(Class 10) (Term – 1) (Session 2021-22)

Time: 1 hour 30 minutes **Number of Questions: 50**

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. Take about 1-gram solid NaCl in a clean and dry test tube and set up the apparatus as shown in figure. Now, say that:

If climate is humid the gas evolved is passed through a guard tube containing:
[A] Calcium hydroxide
[B] calcium carbonate
[C] Calcium sulphate
[D] calcium chloride

2. Calcium phosphate is present in tooth enamel. Its nature is –
[A] Acidic
[B] Basic
[C] Neutral
[D] Amphoteric

3. What is the pH value of saliva after meal?
[A] Between 0 and 4
[B] Between 4 and 5
[C] Between 5 and 6
[D] Between 6 and 7

4. Name the chemicals used in acid fire extinguisher when it is used?
[A] Sodium bi-carbonate, nitrogen and HCl
[B] Sulphuric acid and Carbon dioxide
[C] Nitrogen and Sodium Chloride
[D] Sodium hydrogen carbonate and sulfuric acid

5. Which of the following statement is correct for the water with detergent dissolved in it?
[A] Low concentration of hydroxide ion (OH^-) and high concentration of hydronium ion (H_3O^+)
[B] High concentration of hydroxide ion (OH^-) and low concentration of hydronium ion (H_3O^+)
[C] High concentration of hydroxide ion (OH^-) as well as hydronium ion (H_3O^+)
[D] Equal concentration of both hydroxide ion (OH^-) and hydronium ion (H_3O^+)

6. Which of the following gases can be used for the storage of fresh sample of an oil (which we use for eating or frying purpose) for a long time?
[A] Carbon dioxide or oxygen
[B] Nitrogen or oxygen
[C] Carbon dioxide or Helium
[D] Helium or nitrogen

7. In which of the following chemical equations, the abbreviation represents the correct states of the reactants and products involved at reaction temperature?
[A] $AlCl_3$ (aq) + $3NH_4OH$ (aq) → $Al(OH)_3$ (s)
[B] $AlCl_3$ (aq) + $3NH_4OH$ (l) → $Al(OH)_3$ (aq)
[C] $AlCl_3$ (l) + $3NH_4OH$ (aq) → $Al(OH)_3$ (s) + $3NH_4Cl$ (aq)
[D] $AlCl_3$ (aq) + $3NH_4OH$ (aq) → $Al(OH)_3$ (aq) + $3NH_4Cl$ (s)

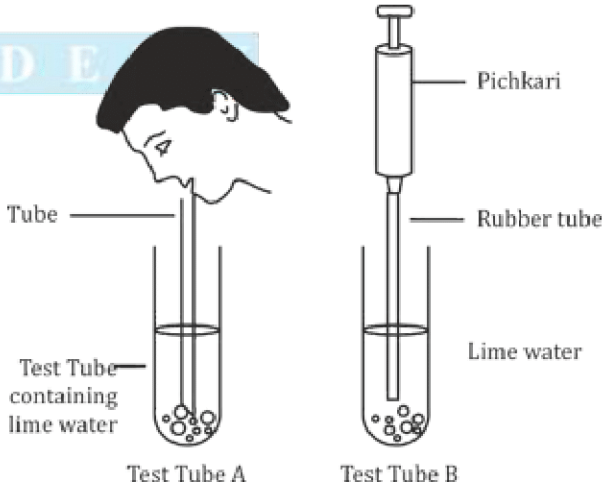
8. The reaction $2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$ is an example of:
[A] Displacement reaction and double displacement reaction
[B] Double displacement reaction and neutralization reaction
[C] Neutralization reaction and combination reaction
[D] Displacement reaction and combination reaction

9. Dilute hydrochloric acid is added to granulated zinc taken in a test tube. The following observation are recorded. Point out the correct observation:
[A] The surface of metal becomes Shiny
[B] The reaction mixture turns milky
[C] Odour of a pungent smelling gas is recorded
[D] A colourless and odourless gas is evolved

10. On heating a blue coloured powder of copper (II) nitrate in a boiling tube, a black substance X, Oxygen gas and a brown gas Y was formed. Identify the products correctly:

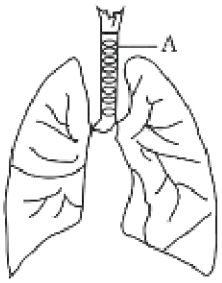
	Black Substance "X"	**Brown Gas "Y"**
[A]	Copper	Nitrogen dioxide
[B]	Copper Oxide	Nitrogen oxide
[C]	Copper Oxide	Nitrogen dioxide
[D]	Copper	Nitrogen oxide

11. Rahul took some freshly prepared lime water in two test tubes marked A and B. He blew air through the lime water in test tube A. He then uses a syringe and passed air through the fresh lime water in test tube B.
Select the incorrect observation from the statements given below:



[I] The amount of carbon dioxide in atmospheric air and excelled air are equal.
[II] Exhaled air contains more carbon dioxide as compared to atmospheric air
[III] Atmospheric air contains more carbon dioxide gas as compared to exhaled air.
[IV] Lime water turned milky immediately in both the test tubes A and B.
[A] Both (I) and (IV)
[B] Both (II) and (IV)
[C] Both (I), (II) and (III)
[D] Both (I), (III) and (IV)

12. In the given picture "A" represents:



[A] Rings of cartilage which ensures that the air passage does not collapse while going into the lungs.
[B] Diaphragm which contracts and flattens upon inhalation
[C] Alveoli where the exchange of gases can take place
[D] Fine hairs for air filtration

13. Which is the first enzyme to mix with food in the digestive tract?
[A] Pepsin
[B] Cellulase
[C] Amylase
[D] Trypsin

14. What happens during digestion of carbohydrates?
[A] Specific hormones break down carbohydrates into simple sugar such as glucose
[B] Specific enzymes break down carbohydrates into fatty acids and glycerol.
[C] Specific enzymes break down carbohydrates into simple sugar such as glucose
[D] Specific hormones break down carbohydrates into fatty acids and glycerol.

15. The excretory system of human beings includes
[A] A kidney, a ureter, a urinary bladder, and a urethra
[B] A pair kidneys, a ureter, a pair of urinary bladders, and a urethra
[C] A pair of kidneys, a pair of ureters, a urinary bladder, and a urethra
[D] A pair of kidneys, a pair of ureters, a pair urinary bladder, and a urethra.

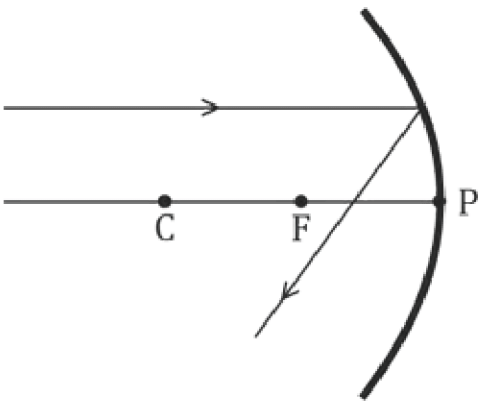
16. A student noted the following observations with four compounds A, B, C and D.

Compound	Melting point (K)	Boiling point(K)
A	1074	1686
B	250	350
C	290	391
D	2850	3120

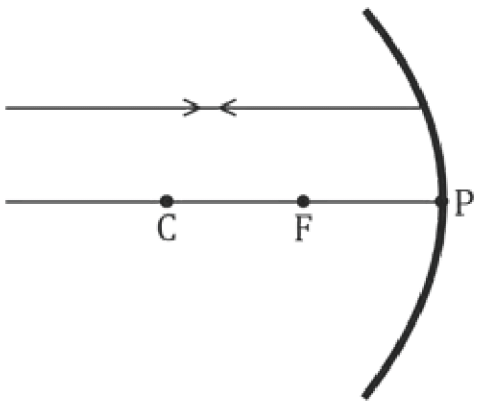
Which of the compounds A, B, C and D are ionic compounds?
[A] A and B
[B] B and C
[C] C and D
[D] A and D

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

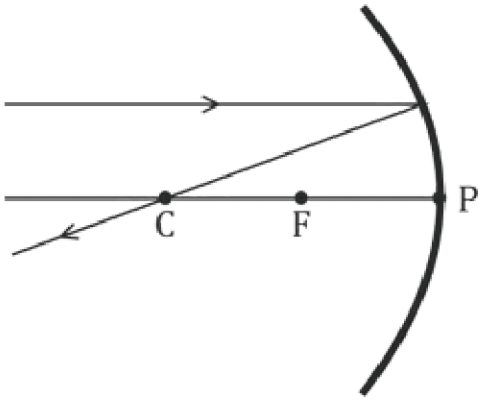
[A]



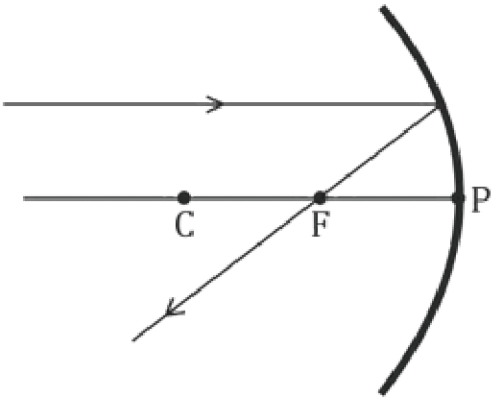
[B]



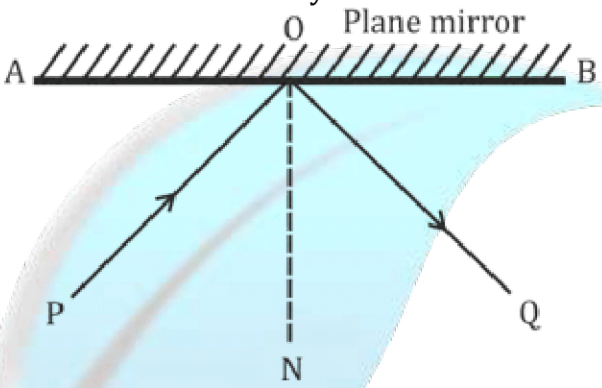
[C]



[D]



18. The angle between the incident and reflected rays is 90° as shown below:



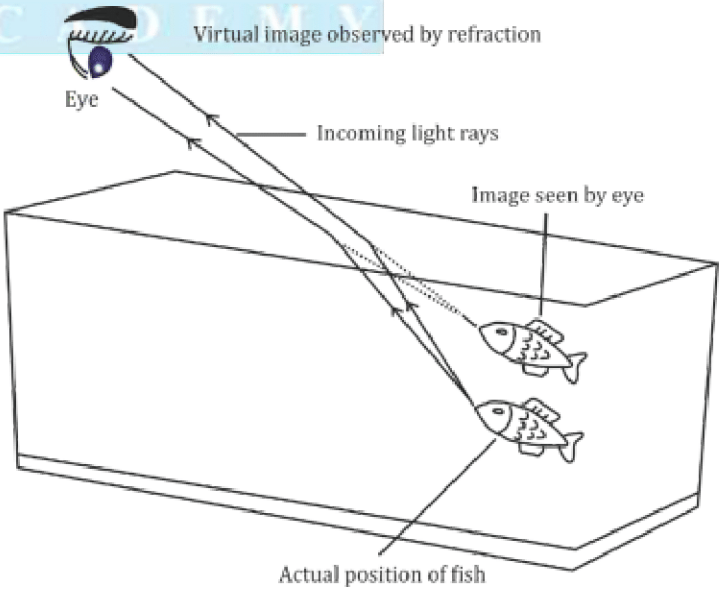
If the plane mirror is rotated by 10° about point-O in the anti-clockwise direction, then the angel between incident and reflected rays will be:

[A] 55°
[B] 90°
[C] 100°
[D] 110°

19. Magnification produced by a rear-view mirror fitted in vehicles:

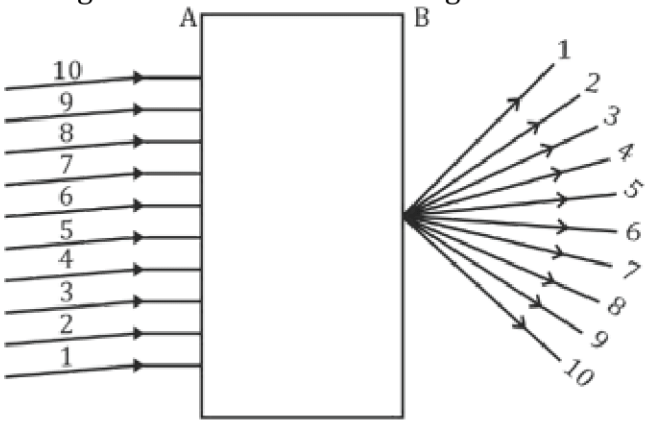
[A] Is less than one
[B] Is more than one
[C] Is equal to one
[D] Can be more than or less than one depending upon the position of the object in front of it.

20. The apparent depth of the fish in water is:



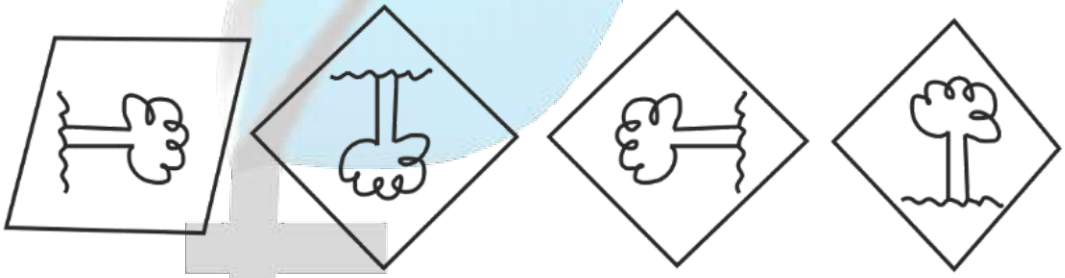
[A] Less than the actual depth because light travels from a rarer medium to denser medium
[B] Less than the actual death because light travels from a denser medium to rarer medium
[C] more than the actual depth because of total internal reflection of light
[D] more than the actual depth because light travels from a denser medium to rarer medium

21. A beam of light is incident through the holes on side A and emerges out of the holes on the other face of the box as shown in the figure. Which of the following could be inside the box?



[A] Concave lens
[B] Rectangular glass slab
[C] Prism
[D] Convex lens

22. A student is performing the experiment of determining the focal length of a given concave mirror by focusing a distant tree on a screen. Which one of the following kinds of images he is likely to obtain on the screen?



[A] Picture (i)
[B] Picture (ii)
[C] Picture (iii)
[D] Picture (iv)

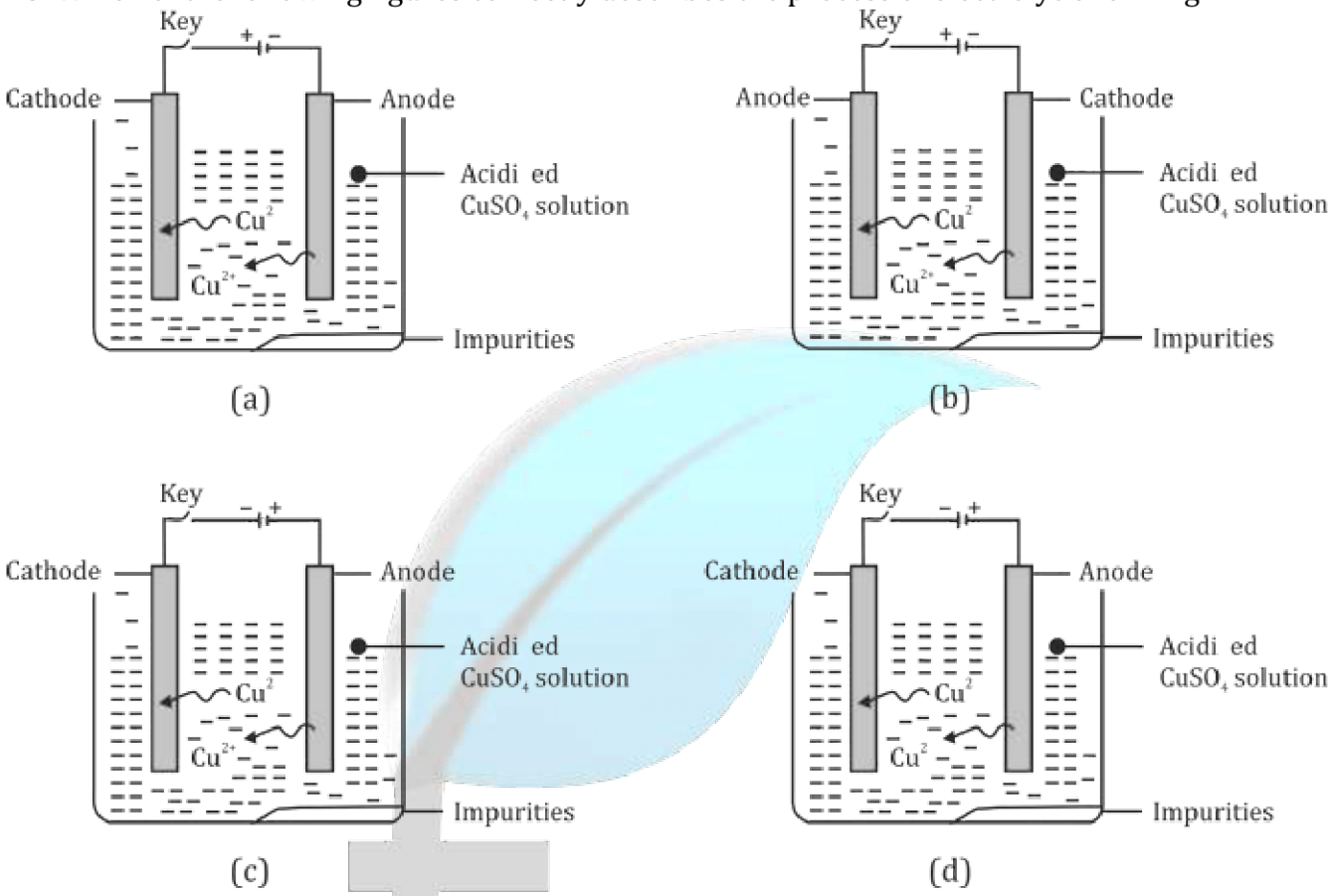
23. A student determines the focal length of a device "X" by focusing the image of a distant object on a screen placed 20 cm from the device on the same side as the object. The device "X" is:
[A]Concave lens of focal length 10 cm
[B]Convex lens of focal length 20 cm
[C] Concave mirror of focal length 10 cm
[D] Concave mirror of focal length 20 cm

24. Magnification produced by a rear-view mirror fitted in vehicles:
[A] is less than one
[B] is more than one
[C] is equal to one
[D] can be more than or less than one depending upon the position of the object in front of it.

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 figures correctly describes the process of electrolytic refining?



26. Aqua regia is a yellow orange fuming liquid, so named by alchemists because it can dissolve the noble metals gold and platinum, though not all metals.
The composition of Aqua-regia is:
[A] Dil. HCl (3): Conc. HNO_3 (1)
[B] Conc. HCl (3): Dil. HNO_3 (1)
[C] Conc. HCl (3): Conc. HNO_3 (1)
[D] Dil. HCl (3): Dil. HNO_3 (1)

27. The student performing this activity noted the following observation on the colour of flame observed when the metal is burnt:

	Metal	Colour of flame
[A]	Aluminium	Blue
[B]	Copper	Yellow
[C]	Sodium	White
[D]	Magnesium	White

28. The correct chemical equation describing the thermite process is:
[A] Fe_2O_3 (s) + 2Al(s) + Heat → 2Fe(s) + Al_2O_3 (l)
[B] Fe_2O_3 (s) + 2Al(s) → 2Fe(l) + Al_2O_3 (s) + Heat
[C] 3FeO(s) + 2Al(s) + Heat → 3Fe(l) + Al_2O_3 (s)
[D] 3FeO(s) + 2Al(s) → 3Fe(l) + Al_2O_3 (s) + Heat

29. What happens when zinc metal is added to a test tube containing $Al_2(SO_4)_3$ solution?
[A] Zinc displaces aluminium from its salt solution
[B] No reaction takes place
[C] The solution becomes blue colour
[D] The solution becomes blue colourless and aluminium metal is deposited

30. The correct arrangement of metals Mg, Zn, Fe and AL in decreasing order of their reactivity with dilute acids is:
[A] AL > Mg > Zn > Fe
[B] AL > Mg > Fe > Zn
[C] Mg > AL > Zn > Fe
[D] Mg > AL > Fe > Zn

Question No. 31 to 35 consists of two segments: **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 [A]: Baking soda creates acidity in the stomach.
Reason [R]: Baking soda is alkaline.
[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**

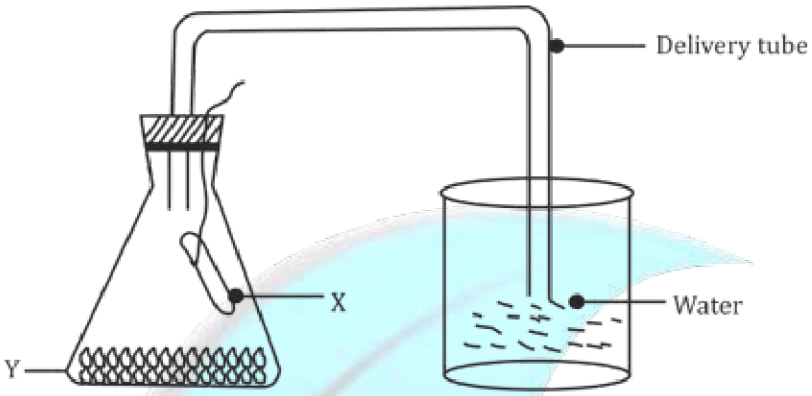
32. Assertion [A]: After white washing the walls, a shiny white finish on walls is obtained after two to three days.
Reason [R]: Calcium oxide reacts with carbon dioxide to form calcium hydrogen carbonate which gives shiny white finish.
[A] Both **A** and **R** are **True** and **R** is the correct explanation 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**

33. Assertion [A]: A mineral is called ore, when metal is extracted from it conveniently and economically.
Reason [R]: All are minerals but all minerals are not ores.
[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**

34. Assertion [A]: In human heart, there is no mixing of oxygenated and deoxygenated blood.
Reason [R]: Valves are present in the heart which allows the movement of blood in One Direction only.
[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**

35. Assertion [A]: If the rays are diverging after emerging from a lens, the lens must be concave.
Reason [R]: The convex lens can give diverging rays.
[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**

36. Name the material "X" filled in the small test tube and the material "Y" placed at the bottom of the conical flask.



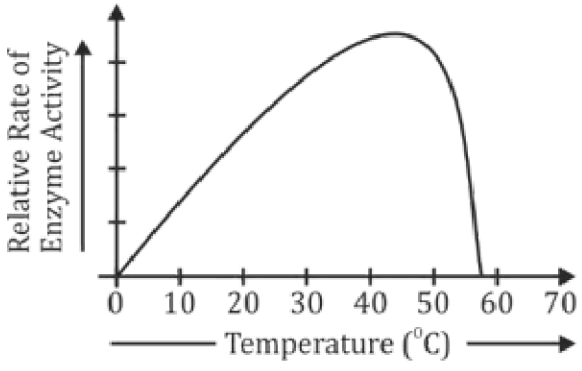
[A] Sodium hydroxide and Iron nails
[B] Hydrogen and sodium
[C] Potassium permanganate and dry seeds
[D] KOH and Wet germinating seeds

37. Find out the incorrect differences between aerobic respiration and anaerobic respiration.

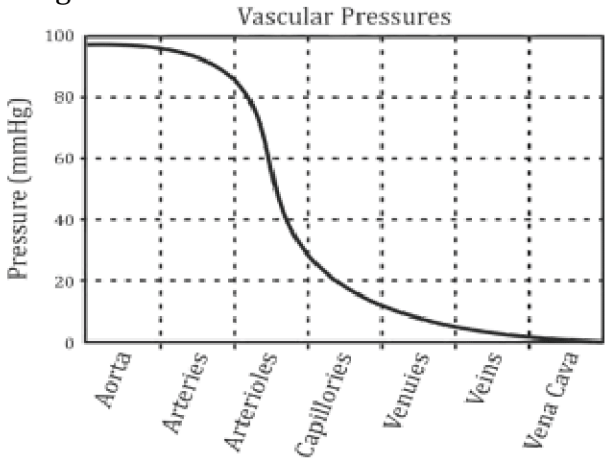
	Aerobic Respiration	Anaerobic Respiration
[A]	aerobic respiration takes place in the presence of oxygen	anaerobic respiration take place in the absence of oxygen
[B]	in aerobic respiration complete breakdown of food takes place	in an aerobic respiration partial breakdown of food occurs
[C]	large amount of energy is released	small amount of energy is released
[D]	end products of aerobic respiration are lactic acid and carbon dioxide	end products of anaerobic respiration are carbon dioxide and water

38. In Cloudy day's situation, what happens to the "photosynthesis"?
[A] No photosynthesis occurs
[B] Slow rate of photosynthesis
[C] Raw materials taken from soil
[D] CO2 and Heat taken through stomata

39. Which statement is valid conclusion based on the information in the graph:
[A] The maximum rate of human digestion of cause at about 45° Celsius
[B] The maximum rate of human respiration occurs at about 57° Celsius
[C] Temperature can influence the action of an enzyme
[D] Growth can be controlled by enzyme



40. The force that blood exerts against the wall of a vessel is



[A] More in arteries and less in vein
[B] More in veins and less in arteries
[C] More in blood capillaries
[D] More in heart

41. Water will be absorbed by the root hairs when the external medium is –
[A] Isotonic
[B] Hypertonic
[C] Hypotonic
[D] Viscous

42. Root pressure is maximum when
[A] Transpiration is very high and absorption is very low
[B] Transpiration is very low and absorption are very high
[C] Both transpiration and absorption are very high
[D] Both the absorption and transpiration are very low

43. Your school laboratory has one large window. To find the focal length of a concave mirror using one of the walls as screen, the experiment may be performed:
[A] on the same wall as the window
[B] on the wall adjacent to the window
[C] on the wall opposite to the window
[D] only on the table as per laboratory arrangement

44. In order to determine the focal length of a concave mirror by obtaining the image of a distant object on screen, the position of the screen should be:
[A] Parallel to the plane of concave mirror
[B] Perpendicular to the plane of concave mirror
[C] Inclined at an angle 60° to the plane of mirror
[D] In any direction with respect to the plane of concave mirror

45. A student has focussed on the screen a distant building using a convex lens. If he has selected a blue coloured building as object, select from the following options the one which gives the correct characteristics of the image formed on the screen.
[A] Virtual, erect, diminished, and green shade
[B] Real, inverted, diminished and in violet shade
[C] Real, inverted, diminished and in blue shade
[D] Virtual, inverted, diminished and in blue shade

46. You are given water, mustard oil, glycerine, and kerosene. In which of these media, a ray of light incident obliquely at some angle would bend the most? (Refractive index of water=1.33, Mustard oil=1.46, Glycerine=1.473, Kerosene= 1.44)

[A] Kerosene
[B] Water
[C] Mustard oil
[D] Glycerine

47. A Student carries out the experiment of tracing the path of a ray of light through a rectangular glass slab for two different values of angle of incidence ∠i = 30° and ∠i = 45°. In the two cases the student is likely to observe the set of values of angle of refraction and angle of emergence as:

[A] ∠r = 30°, ∠e = 20° and ∠r = 45°, ∠e = 28°
[B] ∠r = 30°, ∠e = 30° and ∠r = 45°, ∠e = 45°
[C] ∠r = 20°, ∠e = 30° and ∠r = 28°, ∠e = 45°
[D] ∠r = 20°, ∠e = 20° and ∠r = 28°, ∠e = 28°

48. What happens when calcium is treated with water?

(i) It does not react with water
(ii) It reacts violently with water
(iii) It reacts less violently with water
(iv) Bubbles of hydrogen gas formed stick to the surface of calcium

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

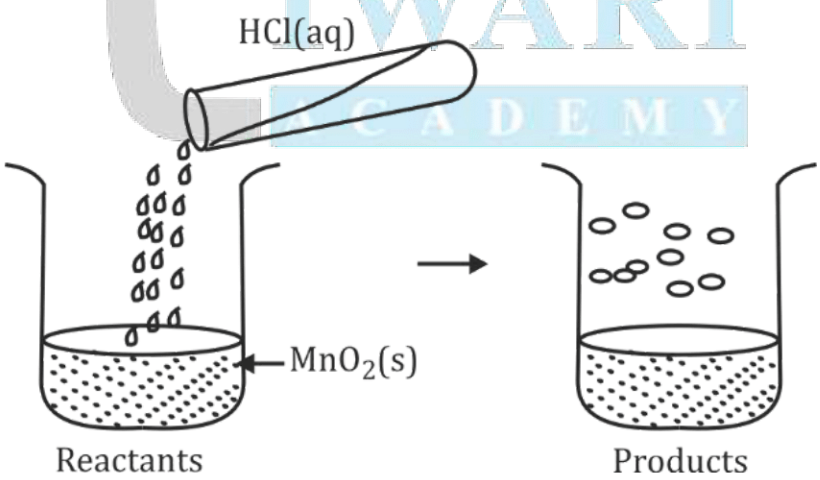
SECTION – C

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 – 1:

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



49. The chemical reaction between MnO_2 and HCl is an example of:

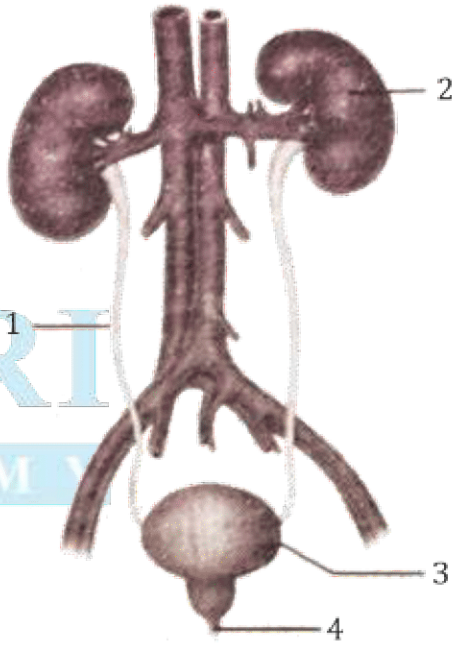
[A] Displacement reaction
[B] Combination reaction
[C] Redox reaction
[D] Decomposition reaction

50. Chlorine gas reacts with _____ form bleaching powder:
[A] Dry $Ca(OH)_2$
[B] Dilute solution of $Ca(OH)_2$
[C] Concentrated solution of $Ca(OH)_2$
[D] Dry CaO

51. Identify the correct statement from the following:
[A] MnO_2 is getting reduced whereas HCl is getting oxidized
[B] MnO_2 is getting oxidized whereas HCl is getting reduced
[C] MnO_2 and HCl both are getting reduced
[D] MnO_2 and HCl both are getting oxidized

52. In the above discussed reaction, what is the nature of MnO_2?
[A] Acidic oxide
[B] Basic oxide
[C] Neutral oxide
[D] Amphoteric oxide

Case – 2:
The given diagram represents the structure of a human excretory system. Study the diagram and answer any of the four questions.



53. Identify the part 1 in excretion.
[A] Kidney
[B] Ureter
[C] Urethra
[D] Nephron

54. Which of these is the structural and functional unit of part 2?
[A] Alveoli
[B] Nephron
[C] Neuron
[D] None of these

55. How can we purify the blood by artificial methods?
[A] Filtration
[B] Dialysis
[C] Re-absorption
[D] All of these

56. The main waste present in the urine is:
[A] Glucose
[B] Urea
[C] Blood
[D] Protein

Case – 3:

A student wants to project the image of a candle flame on the walls of the school laboratory by using a mirror.

57. Which type of mirror should he use and why?
[A] Convex mirror, it forms a virtual image
[B] Concave mirror, it forms a virtual image
[C] Concave mirror, it forms a real image
[D] Convex mirror, it forms a real image

58. At what distance, in terms of focal length "f" of the mirror, should he place the candle flame to get the magnified image on the wall?
[A] At F
[B] Between F and C
[C] At C
[D] At infinity

59. To get the diminished image of the candle flame, the object must be placed at:
[A] Infinity
[B] At C
[C] Between F and C
[D] At F

60. If the image formed by this mirror is inverted and real, the magnification will be:
[A] Positive
[B] Negative
[C] Either of them
[D] None of the above