

Sample Question Paper 2 (Answers)
(TERM – I) (Session 2021-2022)
Class X
Science (086)
SECTION – A

Section - A consists of 24 questions.

The first attempted 20 questions would be evaluated.

1. ANSWER: [D]

Explanation: "Electrolysis" is the process, when water is taken in a beaker and supplied electricity through anode and cathode process, then it is called "Electrolysis". The gas collected at Cathode is hydrogen which is double the volume of oxygen collected at anode. Bubbles can be seen at the time of Electrolysis.



2. ANSWER: [A]

Explanation: When Silver Nitrate solution is added to sodium chloride solution, a white precipitate of silver chloride is formed along with sodium nitrate solution. Hence, your answer will be option [A].

3. ANSWER: [C]

Explanation: As you know that this happens because the standard state for hydrogen and oxygen is gas and for water is liquid at reaction temperature.

4. ANSWER: [D]

Explanation: The maximum decomposition is when the pressure is maximum. The standard atmosphere (symbol: atm) is a unit of pressure defined as 101325 Pa (1.01325 bar). It is sometimes used as a reference pressure or standard pressure. It is approximately equal to Earth's atmospheric pressure at sea level. As we can see in graph that from 0 to 5 minutes, the pressure increases from 0 to 0.625 atm.

5. ANSWER: [B]

Explanation: The balanced chemical equation for the electrolysis of water is:



During electrolysis, water is broken down into Oxygen gas and Hydrogen gas due to the passage of electric current through it. Remember, in a decomposition reaction a compound is broken down into its simpler form.

As you can see that, the mole ratio of hydrogen gases and oxygen gases liberated during electrolysis of water is 2:1 by volume.

6. ANSWER: [D]

Explanation: The acid which ants produce is called methanoic acid or formic acid. The chemical formula of formic acid is HCOOH.

7. ANSWER: [B]

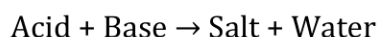
Explanation: As we know that, when zinc granules react with NaOH, salt sodium zincate is formed along with hydrogen gas, which burns with a "POP sound".

8. ANSWER: [D]

Explanation: Chloro-alkali (Chloralkali) process is an industrial process that is used to form Sodium Hydroxide by electrolysis of aqueous solution of sodium chloride. It form NaOH with hydrogen and chlorine gas as by products. Hence, your answer should be option [D].

9. ANSWER: [D]

Explanation: As the neutralisation process is an exothermic reaction, the temperature of the solution increases. When an acid reacts with a base, a neutral salt is formed by the neutralisation process.



10. ANSWER: [A]

Explanation: Generally, If we replaced, sulphuric acid with Sodium Hydroxide, it will produce sodium zincate (salt) and hydrogen gas. Hence, your answer will be option [A].

11. ANSWER: [D]

Explanation: During inhalation, the ribs move out and the diaphragm flattens. As a result, the surface area for gaseous exchange increases. The main site for gaseous exchange in the lungs are alveoli. The alveoli increase the surface area for gaseous exchange in the lungs. Simply, choose the option [D] as an answer.

12. ANSWER: [B]

Explanation: Here, the structure marked as "X" is stomata. Stomata are responsible for gaseous exchange or Transpiration, photosynthesis and respiration, in the plant. If they are blocked, the gaseous exchange, and other process will be affected.

13. ANSWER: [A]

Explanation: Labelled "A" is the Bowman's capsule which is a cup like sac at the beginning of the Tubular component of a nephron in the mammalian Kidney. "B" labelled is that tubular part of the nephron where some substances in the initial filtrate, are selectively re-absorbed as the urine along the tube.

As we know that, fluids from blood in the glomerulus are collected in the Bowman's capsule and further process along the nephron to form urine.

14. ANSWER: [C]

Explanation: Simply try to understand that, blood from right Atrium enters right ventricle and pulmonary arteries carry deoxygenated blood from right ventricle to lungs for oxygenation. Hence your answer will be option [C].

15. ANSWER: [A]

Explanation: Phloem helps in translocation of food. Nephron helps in excretion. Veins carry deoxygenated blood. Platelets help in clotting of blood.

16. ANSWER: [D]

Explanation: There are various differences between veins & arteries. Veins have valves to ensure that the blood flows in one direction only. Arteries do not have any valves as they carry blood away from the heart. They have thick and elastic walls as the blood is generally, under high pressure.

17. ANSWER: [C]

Explanation: Angle "p" is the angle of incidence as this angle is formed between the incident ray and the normal. Angle "y" is angle of emergence as it is formed between emergent ray and the normal. And angle "z" is the angle of deviation as it is formed between the emergent ray and the incident ray. Hence, the correct answer is p, y, z.

18. ANSWER: [C]

Explanation: Try to understand simply, that $\angle i$ is the angle of incidence, which is the angle between the incident ray and the normal at the point of incidence and is marked correctly.

$\angle e$ is the angle of emergence, which is the angle between the emergent ray and the normal at the point of emergence but is wrongly marked in this figure.

$\angle D$ is the angle of deviation, which is the angle between incident ray and emergent ray, but here it is incorrect marked.

$\angle r$ is the angle of refraction, which is the angle between the refracted ray and the normal at the point of incidence and is marked correctly. Hence, your answer should be option [C].

19. ANSWER: [B]

Explanation: As we know that, due to refraction of light by different layers of varying refractive indices, the apparent position of source of light keeps on changing where our atmosphere play a vital role. So, stars appear to Twinkle.

20. ANSWER: [A]

Explanation: Power of eye glass for correction of near sightedness = $P = -2.5D$

Focal length of distance viewing part of the lens = $f = 1/p = -1/2.5 \text{ m} = -0.4 \text{ m} = -40 \text{ cm}$

Power of eye glass for correction of near sightedness = $P = +2.0 D$

Focal length of near vision part of the lens:

$f = 1/p = +1/2 \text{ m} = 0.5 \text{ m} = +50 \text{ cm}$

21. ANSWER: [C]

Explanation: All we know that, when an object moves closer to a concave lens the image will be away from the lens on the same side of an object. Hence your answer will be option [C].

22. ANSWER: [B]

Explanation: When the object is at infinity, diminished, inverted and real image is formed.

23. ANSWER: [D]

Explanation: Among the given options, "S" is the most suitable setup for tracing a Ray of light passing through a rectangular glass slab.

24. ANSWER: [D]

Explanation: Here, we will use lens formula. It is given that the candle (object) is placed at 26 cm and the lens at 50 cm.

Therefore object distance = $-(50 - 26) = -24 \text{ cm}$

Similarly, image distance = $(90 - 50) \text{ cm} = +40 \text{ cm}$

We used the lens formula, to calculate the focal length of the lens:

$1/f = 1/v - 1/u = 1/40 + 1/24 = 8/120$

Therefore, focal length $f = +15 \text{ cm}$.

SECTION - B

Section - B consists of 24 questions (Sl. No. 25 to 48).

The first attempted 20 questions would be evaluated.

25. ANSWER: [C]

Explanation: Metals generally do not show dullness. Metals such as gold and silver are usually shiny rather than dull.

26. ANSWER: [B]

Explanation: Na (sodium) possesses all the above properties. It is too soft and can be cut with a knife. Na is a highly exothermic reaction producing a lot of heat. It also reacts with water and burns due to the vigorous formation of hydrogen gas. That is why sodium is stored in kerosene oil to prevent any reaction.

27. ANSWER: [D]

Explanation: Calcium reacts slowly with water. The reaction forms calcium hydroxide and hydrogen gas. The calcium metal sink in water and after hour bubbles of hydrogen are observed, stuck to the surface of the metal. Hence your answer will be option [D].

28. ANSWER: [B]

Explanation: Magnesium when reacts with water gives magnesium hydroxide and hydrogen gas and not magnesium oxide.

29. ANSWER: [A]

Explanation: Gold (Ag) and copper (Cu) obtained after extraction are in impure form. So, metals like gold and copper are refined by electrolytic refining. Other than gold and copper, electrolytic refining is used for metals such as Zn and Ag. Sodium and potassium are extracted by electrolytic reduction. Metals obtained after electrolytic reduction are in pure form.

30. ANSWER: [B]

Explanation: In this reaction, copper metal is displacing silver from silver sulphate solution, forming copper sulphate and silver metal. The solution will appear blue in Beaker B. Let us see how.

When pieces of copper metal are kept immersed in silver sulphate solution for some time, the solution gradually becomes blue and a shiny greyish-white deposit of silver metal is formed on copper strip. The solution becomes blue due to the formation of copper sulphate. The reason behind this displacement reaction is that copper is more reactive than silver.

On the other hand, copper metal is less reactive than iron and zinc, and hence cannot displace them from their respective salt solutions.

Question No. 31 to 35 consists of two segments – Assertion (A) and Reason (R).

[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. ANSWER: [C]

Explanation: Carbon dioxide reacts with lime water (calcium hydroxide) to form milky precipitate of calcium carbonate.

32. ANSWER: [B]

Explanation: Hydrochloric acid, also known as muriatic acid, creates an acidic medium, which facilitates activation of pepsinogen into pepsin. The active enzyme pepsin converts proteins into proteoses and peptones.

33. ANSWER: [D]

Explanation: Light travels faster in air than in glass, because glass is denser than air.

34. ANSWER: [A]

Explanation: The rays of light from upper and lower part of the periphery of the sun bend unequally on travelling through earth's atmosphere due to atmospheric refraction.

As you know that, during sunrise and sunset sun is near the horizon and sunlight has to travel a longer distance through the earth's atmosphere.

35. ANSWER: [C]

Explanation: Calcium hydroxide Ca(OH)_2 is obtained by reaction of calcium oxide and water.

36. ANSWER: [C]

Explanation: Autotrophs take in food from the outside world and convert them into stored forms of energy. This material is taken in the form of carbon dioxide and water which is converted into carbohydrates in the presence of sunlight and chlorophyll. Hence your answer will be option [C].

37. ANSWER: [B]

Explanation: The absence of amylase in the saliva thus affects the breakdown of starch into simpler sugar molecules. As we know that, the process of digestion begins in the mouth. The mouth contains a digestive enzyme, salivary amylase. This enzyme breaks the starch molecules in the food, into maltose.

38. ANSWER: [B]

Explanation: These are saprotrophs and digestion in saprotrophs takes place before ingestion. They break down and convert complex organic molecules present in dead and decaying matter into simpler substances outside their body.

39. ANSWER: [B]

Explanation: Remember that, a nephron is a filtering unit present in kidney. It has different parts like Bowman's capsule, glomerulus and tubular region (renal tubule). Glucose and amino acids and salts are selectively reabsorbed in tubular region.

40. ANSWER: [B]

Explanation: Amoeba engulfs its food particles by performing pseudopodia around it. The food particles get surrounded by encircling pseudopodia's tips. Pseudopodia (false feet) are developed in amoeba. At this point the cell membrane closer to food particle gets dissolved and the food is captured into the cell. The process of ingestion in Amoeba is called phagocytosis.

41. ANSWER: [C]

Explanation: Hemodialysis is used to remove nitrogenous waste products from the blood.

42. ANSWER: [D]

Explanation: Yeast is a unicellular eukaryote which carries out ethanol fermentation. In the first phase, glucose is converted into pyruvate (glycolysis) in the cytoplasm of the cell & produce ethanol and carbon dioxide in the second phase.

Due to limited oxygen availability, pyruvate remains in cytoplasm where pyruvate decarboxylase and alcohol dehydrogenase enzymes.

43. ANSWER: [D]

Explanation: Remember, the laws of reflection hold true for all reflecting surfaces.

44. ANSWER: [C]

Explanation: Convex lens is used for reading small letters found in a dictionary. This is because it magnifies or enlarges the image of the object. As convex lens of shorter focal length has greater power as compared to convex lens of greater focal length, we will use convex lens of focal length of 5 cm.

45. ANSWER: [B]

Explanation: When a light ray is passed through a glass slab obliquely, then, the emergent ray is parallel to the direction of the incident ray. The extent of bending of the ray of light at the opposite parallel faces AB (air glass interface) and CD (glass air interface) of the rectangular glass slab is equal and opposite. That's why the ray emerges parallel to the incident ray.

46. ANSWER: [A]

Explanation:

- 1) The angle of incidence is the angle between the incident ray and the normal at the point of incidence.
- 2) The angle of emergence is the angle between the emergent ray and the normal at the point of emergence.
- 3) The protractor should always be placed in such a way that its base is always along the normal of the incident ray.

47. ANSWER: [A]

Explanation: A concave mirror forms a distinct image of a distant object at its focus. As the student 'A' measures the distance between mirrors to the screen to find the focal length, he measured the focal length correctly. Hence your answer will be option [A]

48. ANSWER: [C]

Explanation: Metals such as gold and silver are found as native metals.

SECTION – C

Section - C consists of three Cases followed by questions. There are a total of 12 questions in this section.

The first attempted 10 questions would be evaluated.

Case – 1:

49. ANSWER: [B]

Explanation: The lens L_1 produces a parallel beam of light when a strong source of light is kept at its focus. The lens L_2 converges a parallel beam of light and we get a sharp image of the circular hole on the screen.

50. ANSWER: [C]

Explanation: We will find fine microscopic sulphur particles precipitating in about 2 and 3 minutes due to the reaction between sulphuric acid sodium thiosulphate.

51. ANSWER: [C]

Explanation: As the sulphur particles begin to form, we will observe blue light from the three sides of the glass tank. This is due to scattering of short wavelength by a minute colloidal sulphur particle. The colour of the transmitted light from the fourth side of the glass tank facing the circular hole will be orange at first and then bright crimson red colour on the screen.

52. ANSWER: [A]

Explanation: When the sulphur particles begin to form a colloidal solution is formed in the glass tank due to which short wavelength of light are scattered by the minute colloidal sulphur particles.

Case – 2:

53. ANSWER: [D]

Explanation: CORONA-19 is a respiratory disease as it mainly affects the lungs. It is transmitted from an infected person mostly by respiratory droplets released into the air when an infected person sneezes or coughs directly without covering his mouth or nose. It is caused by a virus, the novel corona virus, and no antibiotics are effective against viral infections.

54. ANSWER: [A]

Explanation: Tuberculosis is a potentially serious infectious bacterial disease that mainly affects the lungs. The bacteria that cause TB are spread when an infected person coughs or sneezes.

55. ANSWER: [B]

Explanation: Within the lungs, we get balloon-like structures which are called alveoli. It can be found the passage divides into smaller and smaller tubes which finally terminate as alveoli.

56. ANSWER: [B]

Explanation: 1) Trachea or windpipe has rings of cartilage (it splits into the left and right lungs). 2) The epiglottis covers the larynx (the food does not enter the windpipe while eating).

Case – 3:

57. ANSWER: [B]

Explanation: Piyush was unable to read what was written on the blackboard, he was suffering from short sightedness or myopia. A person with myopia can see nearby objects clearly but cannot see distance objects distinctly. Here, your answer will be option [B].

58. ANSWER: [A]

Explanation: As Piyush is suffering from myopia. A person with this defect has the far point nearer than Infinity. A person suffering from this defect may see clearly up to a distance of a few metres. That is why myopia is also known as short sightedness.

59. ANSWER: [C]

Explanation: In a myopic eye, the image of a distant object is formed in front of the retina and therefore a concave lens or diverging lens is used for its correction.

60. ANSWER: [B]

Explanation: As focal length of the corrective lens is negative, the type of lens used as a concave lens: To find the focal length we use the lens formula:

$$1/f = 1/v - 1/u = -1/50 = f = -0.5 \text{ m}$$

$$\text{Power of the lens} = -1/0.5 = -2.0 \text{ D}$$