**Sample Question Paper 9 (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: [C]
Explanation: Phenolphthalein solution turns pink in basic solutions. While adding on solution "B" the pink colour disappears, that means it has a pH less than 7, and then the pH of the final solution will decrease. So, "A" has pH greater than 7 and "B" has pH less than 7.

2. ANSWER: [A]
Explanation: $Na_2CO_3$ is a basic salt.

3. ANSWER: [B]
Explanation: Potassium sulphate, potassium chloride, sodium nitrate, baking soda, etc., lts that do not contain water of nitrate, barium is the crystallisation.

4. ANSWER: [C]
Explanation: Such as sodium hydroxide, baking soda, washing soda and many more, common salt besides being used in kitchen can also be used as the raw material.

5. ANSWER: [C]
Explanation: The role of calcium chloride taken in the guard tube is to absorb moisture from the gas. This is because calcium chloride is used as a drying agent which absorbs moisture from the hydrogen chloride (HCI) gas.

6. ANSWER: [B]
Explanation: Magnesium when reacts with water gives $Mg(OH)_2$ and $H_2$ and not magnesium oxide.

7. ANSWER: [D]
Explanation: Metals like aluminium, zinc, iron do not react with hot or cold water. Aluminium, zinc, iron react with water only when water is in the form of steam.

8. ANSWER: [C]
Explanation: You must know that "Polyvinyl chloride (PVC)" is a polymer and bad conductor of electricity. Hence, your answer should be option [C].

9. ANSWER: [C]
Explanation: Metals such as gold and silver are found as native metals.

10. ANSWER: [B]
Explanation: $Mg\ (s) + H_2SO_4\ (aq) \rightarrow MgSO_4\ (aq) + H_2 \uparrow$ - is the balanced chemical reaction. A balanced equation is the one in which the atoms of every element will be the same on both the sides of the equation.

11. ANSWER: [A]
Explanation: Cuscata is a parasitic plant that obtains its nutrition from other plants by growing on them.

12. ANSWER: [D]
Explanation: Small intestine is the site of complete digestion of all the nutrients present in the food.

13. ANSWER: [B]
Explanation: The break down of pyruvate to give carbon dioxide, water, and energy requires the presence of oxygen and takes place in mitochondria.

14. ANSWER: [A]
Explanation: Ethyl alcohol is obtained as the product of the alcoholic fermentation. This process involves release of small amount of energy.

15. ANSWER: [D]
Explanation:
1) Transpiration pull created by transpiration of water from leaf surface causes ascent of sap (upward movement of water and mineral salts).
2) The sap absorbed from the soil contains low concentration of mineral salts.
3) The loss of water through transpiration increases the concentration of mineral salts in the plant.
4) Due to the heat of the Sun, temperature of the plant increases which may be harmful for the plants.
5) Excess dehydration reduces the rate of photosynthesis and other metabolic activities, which may further lead to deformation in plants.
6) Transpiration lowers down the temperature of the plant by 10°-15°C.
7) Due to transpiration being higher than the rate of water absorption at noon time wilting or loss of turgidity is quite common.

16. ANSWER: [A]
Explanation: The accurate way of air when it leaves the lungs is:
Alveolus → bronchiole → bronchus → trachea → nose

17. ANSWER: [B]
Explanation: A concave mirror can be used to burn a piece of a paper by focusing reflected rays of the sun.

18. ANSWER: [C]
Explanation: You must know that, when an image formed by plane mirror is always virtual and erect. It is laterally inverted i.e., the right side of the object appears left side of the image and vice versa.

19. ANSWER: [D]
Explanation: Given, velocity of light wave doubles in second medium. Let velocity of light in first medium be v.
Velocity of light in second medium = 2v
sin C = Velocity in 1st medium / Velocity in 2nd medium = v/2v = ½, so C = 30°

20. ANSWER: [A]
Explanation: All we know that the Sun is directly over the head and sunlight travel relatively shorter distance causing only little of the blue and violet colours to be scattered.

21. ANSWER: [B]
Explanation: We must know that air have different layers which act as varying refractive indices and when light enters by different layers of the apparent position of source of light keeps on changing. It happens due to refraction of light. So, stars appear to twinkle.

22. ANSWER: [B]
Explanation: Red colour scatters the least so that it travels the farthest. During sunset or sunrise, light has to travel a longer distance to reach us. The sky appears reddish as when only red light reaches to us. Hence, you should go with the option [B].

23. ANSWER: [A]
Explanation: The phenomenon of scattering of light by colloidal particles gives rise to tyndall effect.

24. ANSWER: [B]
Explanation: Light slower through other materials such as glass or water and light waves travel fastest through a vacuum and air.

## SECTION - B

**Section - B consists of 24 questions (Sl. No. 25 to 48).**
*The first attempted 20 questions would be evaluated.*

25. ANSWER: [A]
Explanation: The balance chemical equation is:

$$3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$$

26. ANSWER: [C]
Explanation: The digestion of food is a decomposition reaction, while the others are combination reaction.

27. ANSWER: [D]
Explanation: Combination reaction is a reaction in which two or more reactants react together to form a single product. In reaction (ii) MgO and $H_2O$ combine to form $Mg(OH)_2$ and in reaction (iii), Al and $O_2$ combine to form $2Al_2O_3$.

28. ANSWER: [C]
Explanation: Remember, calcium chloride is used as a drying agent which absorbs moisture from the hydrogen chloride (HCl) gas.

29. ANSWER: [B]
Explanation: Metal oxides are basic in nature. They form salts and water when react with acids except some amphoteric oxides like zinc oxide and aluminium oxide, thus, metal oxides are not salts. Therefore, all metal oxides react with water to give salt and acid is not correct.

30. ANSWER: [C]
Explanation: Property of acids is that it is sour in taste and change blue litmus to red.

31. ANSWER: [A]
Explanation: Lemon juice is sour in taste, as it is an acid sour taste is one of the characteristics of acid. Therefore, lemon juice is acidic in nature.

32. ANSWER: [A]
Explanation: Platinum, gold and silver are highly malleable, lustrous and least reactive, i.e., noble metals, so they are not corroded by air and wire easily.

33. ANSWER: [C]
Explanation: Like human beings & other organism plants also excrete various waste products during their life process. The waste products include gums, carbon dioxide, oxygen, resin, and rubber etc. Plants do not produce urea.

34. ANSWER: [A]
Explanation: In case of goggle, both the curve surfaces have equal radii of curvature. So, the focal length has of lens become infinite.
Power (p) = 1/f = 0

35. ANSWER: [D]
Explanation: Higher the refractive index of prism, greater will be the angle of deviation.

36. ANSWER: [C]
Explanation: Remember, Iron reacts only with steam to form a metal oxide and hydrogen. Hence, your answer will be option [C].

37. ANSWER: [C]
Explanation: With the help of this given experiment, the main aim is used to show that sunlight is essential for photosynthesis.

38. ANSWER: [B]
Explanation: Here in this diagram type of question Q and S have the highest concentration of oxygen in the blood.

39. ANSWER: [B]
Explanation: Nephron is the structural and functional unit of excretory system.

40. ANSWER: [B]
Explanation: Platelets help in blood clotting and Plasma transports digested food to the cells.

41. ANSWER: [A]
Explanation: Here, remember, Glycolysis is the common phase between aerobic and anaerobic respiration.

42. ANSWER: [A]
Explanation: It is a convex mirror. The pole, focus, focal length, and centre of curvature, all are behind the mirror and as we know that when it is behind the mirror it will be positive.

43. ANSWER: [C]
Explanation: An image formed is inverted and virtual, when a convergent beam of light is incident on a plane mirror.

44. ANSWER: [C]
Explanation: During the refraction of light wavelength and speed change. Frequency is always a constant quantity.

45. ANSWER: [D]
Explanation: When the object is placed at "C" of a concave mirror, the distance between a real object and its real image is zero.

46. ANSWER: [A]
Explanation: A convex produces only virtual and diminished images of objects.

47. ANSWER: [C]
Explanation: The correct lens formula is: $1/v - 1/u = 1/f$

48. ANSWER: [C]
Explanation: The term used to refer the student to which image of an object can be magnified is magnification.

## 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: [A]
Explanation: Metals like Fe, Zn, and Al do not react with cold for hot water. Iron, Zinc, and Aluminium react with steam to form corresponding hydroxide and hydrogen gas.

50. ANSWER: [C]
Explanation: Metals react with water to produce metal oxide and hydrogen gas. Metal oxides that are soluble in water, dissolve in water to form metal hydroxide.

51. ANSWER: [D]
Explanation: Always Remember, hydrogen gas is recognised by pop sound.

52. ANSWER: [B]
Explanation: Sodium and potassium react violently with the release of huge amount of heat. So the reaction is highly exothermic. Hydrogen gas which is produced during the reaction catches fire. Calcium reacts less violently with water. The heat evolved is not sufficient for the hydrogen to catch fire. Instead, calcium floats over water because bubbles of hydrogen gas stick to the metal surface Aluminium, iron, and zinc react with steam to form respective oxide and hydrogen gas. Thus, metals react with water to form metal hydroxide and hydrogen gas, which we can check by placing a match-stick near it. The order of reactivity with water in descending order is Na > K > Ca > Zn > Fe > Al.

**Case – 2:**

53. ANSWER: [D]
Explanation: When oxygen reacts with UV rays it breaks down as free oxygen (O) atoms. Again free atoms combine with oxygen and creates $O_3$.

$$O_2 + UV \rightarrow O + O$$
$$O + O_2 \rightarrow O_3$$

54. ANSWER: [A]
Explanation: Ozone is present in very low concentration in the lower atmosphere or troposphere. It is present in higher concentrations in the upper atmosphere or stratosphere. It is quite harmful when present in the lower atmosphere as it causes several diseases in humans. It is beneficial when present in upper atmosphere as it shields the surface of the earth from the harmful ultraviolet radiations of the sun.

55. ANSWER: [B]
Explanation: The depletion of ozone layer is linked to synthetic chemicals such as chlorofluorocarbons (CFCs) which are used as refrigerants, aerosol sprays and in fire extinguishers.

56. ANSWER: [D]
Explanation: Ozone layer depletion causes increased incidence of ultraviolet radiations on the surface of the earth and this causes skin cancer, cataract and other eye damage. Tides are caused due to the gravitational pull of the moon on the earth, not the consequence of ozone layer depletion.

**Case – 3:**

57. ANSWER: [A]

Explanation: When the light disperses, various bands of light are clearly visible with White light consists of seven colours.

58. ANSWER: [C]

Explanation: All of colours of light do not travel with same speed in the medium. The various colours of white light have different extent of refraction in a medium which is the cause of dispersion of light.

59. ANSWER: [A]

Explanation: The various colours of white light have different extent of refraction in a medium which is the cause of dispersion of light. When light enters through the prism, all the colours splits & travel with the different speed of light.

60. ANSWER: [A]

Explanation: As we know that -rainbow is caused by "Dispersion of Sunlight" by tiny water droplets present in the atmosphere which is one of the applications of dispersion of light. Hence, you should go with the option [A].