Sample Question Paper 7 (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: [B]
Explanation: Of the given options, only Equation IV is not balanced. The balanced equation is:

$$Cu + 4HNO_3 \rightarrow Cu(NO_3)_2 + 2NO_2 + 2H_20$$

2. ANSWER: [B]
Explanation: Remember, a substance which take part in a chemical reaction when products are formed during that reaction, called reactants. Hence, your answer will be option [B].

3. ANSWER: [B]
Explanation: You must know that - when lead nitrate is heated, it breaks down into lead monoxide (PbO), nitrogen dioxide (NO_2) and oxygen (O_2). Your answer will be option [B].

4. ANSWER: [B]
Explanation: The balanced equation is:

$$Mg + 2H_20 \rightarrow Mg(OH)_2 + H_2$$

5. ANSWER: [A]
Explanation: When manganese dioxide reacts with hydrochloric acid, the manganese dioxide (MnO_2) reduces to $MnCl_2$ while hydrochloric acid (HCl) oxidizes to chlorine gas (Cl_2). So, "X" is Cl_2.

6. ANSWER: [B]
Explanation: All metals combine with oxygen to form metal oxides, that are basic in nature gas is expelled out and turns red litmus solution blue.

7. ANSWER: [D]
Explanation: Metals like lead, copper, silver, and gold do not react with any form of water.

8. ANSWER: [C]
Explanation: In Latin, the meaning of "AQUA – REGIA" is Water which is loyal or in another words Loyal water. Aqua – regia can be prepared by mixture of two chemicals, (used by jewellery) first is concentrated HCl and concentrated HNO_3 in the ratio of 3:1. It dissolves gold metal very easily.

9. ANSWER: [C]
Explanation: The metals from least reactive to most reactive is: Ag<Sn<Zn<Ca<Na.

10. ANSWER: [C]
Explanation: Solution of pH can be made, when Sodium hydroxide (NaOH) that dissolves in water to form a solution. Which has pH as greater than 7. Because it is an alkali.

11. ANSWER: [C]
Explanation: You must know that the main site of photosynthesis, is Chloroplast which is present in the leaf. Chloroplast contains a green pigment (appears green colour) called chlorophyll.

12. ANSWER: [D]
Explanation: Bile is dark green or a yellowish-brown fluid which is produced by the liver and comes to the small intestine through hepato-pancreatic duct.

13. ANSWER: [B]
Explanation: As we know that gas that diffused or released out from a capillary into an alveolus is carbon form which is carbon dioxide (CO_2). During exhalation process carbon dioxide (CO_2) gas is expelled out. Hence, your answer should be option [D].

14. ANSWER: [C]
Explanation: In the given question "X" is vein that carry deoxygenated blood, "Y" are Capillaries, and "Z" are arteries that carry oxygenated blood.

15. ANSWER: [B]
Explanation: Translocation is the transport of soluble products of photosynthesis (food or glucose) from one part to the other parts of the plant.

16. ANSWER: [C]
Explanation: As we know that in the process of nutrition in animals, there are five journey or steps. They are: Ingestion as first, Digestion as second, Absorption as third, Assimilation as fourth and last is Egestion. Hence, you should go with the option [C].

17. ANSWER: [C]
Explanation: Glass prism, not hollow prism. Remember, a light beam which is white light gives a spectrum on passing by a prism (glass). This phenomenon is called dispersion of light. Hence, you should go with the option [C].

18. ANSWER: [C]
Explanation: When an inverted prism (Y) is placed in the path of dispersed light then after passing through the prism, they recombine to form white light.

19. ANSWER: [B]
Explanation: Remember, a light or objects looks black, when an object absorbs all the seven colours and reflects none. That time it looks like black in colour.

20. ANSWER: [D]
Explanation: The smoke particles scatter the white light and hence the path of light beam becomes visible.

21. ANSWER: [D]
Explanation: We can see the sky because the sunlight gets scattered by the particles present in the atmosphere. Without it, the sky would be dark and black with just the sun and the stars as bright objects in space.

22. ANSWER: [D]
Explanation: A red coloured object appears to be red because it reflects red colour.

23. ANSWER: [A]
Explanation: The colloidal particles, can create Tyndall effect as it is due to scattering of light by the colloidal particles. Rainbow is formed due to dispersion of light and the appearance of star position than its actual position is due to atmospheric refraction.

24. ANSWER: [D]
Explanation: The laser optical density, the more is the speed of the light.

SECTION - B

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

25. ANSWER: [B]
Explanation: The green colour compound "X" is $FeSO_4.7H_2O$.
$FeSO_4.7H_2O + Heat \rightarrow FeSO_4 + 7H_2O$
Ferrous sulphate decomposes with evaluation of a gas having a typical smell of burning sulphar.
$2FeSO_4 + Heat \rightarrow Fe_2O_3 + SO_2 + SO_3$
SO_2 and SO_3 are acidic in nature, turn blue litmus red as they react with water to form acids.
$SO_2 + H_2O \rightarrow H_2SO_3$
$SO_3 + H_2O \rightarrow H_2SO_4$
Hence, "X"= $FeSO_4.7H_2O$, "Y" = Fe_2O_3 and "Z" = SO_2, SO_4

26. ANSWER: [A]
Explanation: In the given equation, level (i) represents oxidising agent, (ii) is oxidation, (iii) is reduction and (iv) represents reducing agent.
$CuO + H_2 \rightarrow Cu + H_2O$

27. ANSWER: [B]
Explanation: On heating, lead nitrate decomposes to give yellow lead monoxide, nitrogen dioxide (emission of brown fumes) and oxygen gas. The reaction that takes place is:
$2Pb(NO_3)_2 + Heat \rightarrow 2PbO + 4NO_2 + O_2$

28. ANSWER: [D]
Explanation: You must know that - Glucose ($C_6H_{12}O_6$) and ethanol (C_2H_5OH) do not conduct electricity while NaOH and HCI conduct electricity as they produce ions in the solution. Hence, you should go with the option [D].

29. ANSWER: [B]
Explanation: Positively charged ions are called cations as they are deposited at negatively charged pole. Negatively charged ions are called anions as these are deposited at positively charged pole. That's why the negatively charged pole is called cathode and positively charged pole is called anode.

30. ANSWER: [D]
Explanation: Remember, if a solution is basic in nature, to reverse the change acid should be added to it, the solution turns red litmus to blue. Hence, choose HCl from the given option [D] as an answer.

31. ANSWER: [B]
Explanation: A chemical reaction is a process in which one or more substances, also called reactants, OR a process that involves rearrangement of the molecular or ionic structure are converted to one or more different substances, known as products, called chemical reaction.

32. ANSWER: [A]
Explanation: Sodium carbonate - Na_2CO_3, is a basic salt. It is a salt of weak acid and strong base.

33. ANSWER: [B]
Explanation: Plants require sunlight, water (H_2O), chlorophyll, and carbon dioxide (CO_2) as raw materials for photosynthesis. Oxygen Or O_2 is released as by-product through stomata on leaf.

34. ANSWER: [D]
Explanation: A beam of white light gives a spectrum on passing through a glass prism. The band of seven colours formed due to dispersion of white light is called spectrum. Dispersion takes place because the refractive index of medium for different colour is different. Therefore, when white light travels from air to air, refractive index remains same and no dispersion occurs.

35 ANSWER: [C]
Explanation: "A" is true but "R" is false. Phenolphthalein is a synthetic indicator. It is used in titration of acid and base. It will appear pink in basic solution and clear in acidic solution.

36. ANSWER: [A]
Explanation: The most reactive metal is C and the least reactive metal is B.

37. ANSWER: [A]
Explanation: 1) Respiration is catabolic while photosynthesis is an anabolic process.
2) ATP is the higher energy form (the recharged battery) while ADP is the lower energy form.
3) In respiration, glucose is broken down into water and carbon dioxide (and energy).
4) In contrast carbon dioxide and water combine in the presence of sunlight to produce glucose and oxygen during photosynthesis.

38. ANSWER: [B]
Explanation: Pyruvate is converted into lactic acid when there is a lack of oxygen in our muscle cells.

39. ANSWER: [D]
Explanation: Our body needs more energy when we do exercise. We get energy from the oxidation process of food. Due to exercise the body is able to get rid of excess carbon dioxide (CO_2).

40. ANSWER: [B]
Explanation: The experimental set up is used to prove that carbon dioxide is essential for photosynthesis.

41. ANSWER: [B]
Explanation: Green plants prepare food by taking CO_2 from the air by the process of photosynthesis. Photosynthesis occurs more at noon. Hence the carbon dioxide gas is less during noon.

42. ANSWER: [C]
Explanation: If an image formed behind the concave mirror, the object distance is positive but if an image is formed in front of the mirror, the image distance is negative.

43. ANSWER: [A]
Explanation: A negative sign in the magnification value indicate that the image is real and inverted.

44. ANSWER: [D]
Explanation: An image formed by concave mirror is virtual, when the object is placed between "P" and "F".

45. ANSWER: [D]
Explanation: All the incident rays will be parallel to the principal axis and after reflection or refraction the actually need for a meet at the principal focus.

46. ANSWER: [C]
Explanation: The object is at infinity, so to obtain sharp image screen should be removed towards mirror.

47. ANSWER: [C]
Explanation: When a ray of light passes through the glass slab, then the angle of incident is found to be nearly equal to angle of emergence and greater than angle of refraction.

48. ANSWER: [D]
Explanation: Out of the given four materials, the refractive index of glycerine is highest. So, greatest deviation of incident light ray is observed in case of glycerine.

SECTION – C

Section - C consists of three Cases followed by questions. There are a total of 12 questions in this section. *The first attempted 20 questions would be evaluated.*

Case – 1:
49. ANSWER: [B]
Explanation: Copper oxide is black in colour. When dilute hydrochloric acid is added in it, the colour of the solution becomes blue green due to formation of copper chloride.

50. ANSWER: [B]
Explanation: The balanced chemical equation of the reaction is:

$$Cu(OH)_2 + 2HCl(dil) \rightarrow CuCL_2 + 2H_2O$$

51. ANSWER: [A]
Explanation: Copper oxide (p) is basic in nature since it reacts with an acid to form salt and water.

52. ANSWER: [A]
Explanation: Sodium hydroxide (a strong base) reacts with hydrochloric acid to form sodium chloride and water. NaOH(aq) +HCl(aq) → NaCl(aq) +H2O(l)
Since, in the reaction between an acid and a base both neutralize each other, it is known as neutralization reaction.

Case – 2:

53. ANSWER: [A]

Explanation: It is clear from the given graph that the person is taking 5 breaths per 20 sec, so in 1 minute (60 sec) he will take 5x60/20=15 breaths.

54. ANSWER: [A]

Explanation: Point "D" shows increases in the volume of lungs, thus at this point, inspiration is taking place while point "F" shows decrease in the volume of lungs, thus at this point, expiration is taking place.

55. ANSWER: [A]

Explanation: As the volume increases, (as shown by the part 'X' of the graph), causing inspiration, and it will cause the air from outside to rush inside the lungs.

Increasing the volume of lungs, happens when Contraction of the diaphragm muscles make it flat and contraction of the external intercostal muscles causes upward and outward movement of ribcage.

56. ANSWER: [A]

Explanation: The volume of the thoracic cavity increases when the diaphragm contracts and flattens.

Case – 3:

57. ANSWER: [A]

Explanation: Where, "i" (angle of incidence) and Refractive index "n" = sin i/sin r.

Where "r" (angle of refraction) and sin "i"/sin "r" for a particular medium remains same i.e., constant.

58. ANSWER: [C]

Explanation: Try to understand –

$nA = \sin i/\sin r = \sin 45°/\sin 45° = 1$

$nB = \sin i/\sin r = \sin 45°/\sin 45° = 1/\sqrt{2} \times 2/1 = \sqrt{2} = 1.414$

Hence, proved that - $nA < nB$

59. ANSWER: [C]

Explanation: The speed of light is higher in a rarer medium than in a denser medium.

60. ANSWER: [D]

Explanation: When a beam of light passes from a denser medium to a rarer medium, its velocity increases and wavelength decreases, per frequency remains constant.