Class - X
Periodic Assessment-II
(2022-23)
Science

Date : 26 Sept. 2022
Time: 3hrs

Roll No.:.....
M.M : 80

General Instructions

- Section A - Q1 to 33 carry 1 mark each.
- Section B - Q34 to 40 carry 2 marks each.
- Section C - Q41 to 46 carry 3 marks each.
- Section D - Q47 to 49 carry 5 marks each.

SECTION-A (33x1=33)

1. The correct sequence of processes that take place in a rainbow is_____.
   a) Reflection → Refraction → Dispersion
   b) Dispersion → Refraction → Reflection
   c) Refraction → Reflection → Dispersion
   d) Refraction → Dispersion → Reflection (1)

2. The image produced by a convex lens of focal length 20cm is 4 times the size of the object. The object may be placed_____. (1)
   a) beyond 40cm
   b) between 20cm-40cm
   c) before 20cm
   d) both (b) and (c)

3. Which of the following can burn a piece of paper by focussing the sunrays on the paper? (1)

a) Concave mirror and Concave lens
b) Concave mirror and Convex lens
c) Convex mirror and Concave lens
d) Convex mirror and Convex lens

4. In short-sightedness_____. (1)
a) far point recedes away
b) far point comes closer
c) near point recedes away
d) near point comes closer

5. Which of the following phenomena does not occur due to atmospheric refraction? (1)
a) Red colour of sun during morning and evening
b) Twinkling of stars
c) Stars appearing to be higher than they actually are.
d) Duration of daylight increasing by about 4 minutes everyday

6. Assertion: An ink dot on paper appears to be raised when a glass slab is placed over it. (1)
Reason: Refraction causes bending of light away form from the normal, as it goes from denser medium to rarer medium.
a) Both Assertion and Reason are true, and reason is the correct explanation of assertion.
b) Both Assertion and Reason are true, but reason is NOT the correct explanation of assertion.
c) Assertion is true, Reason is false.
d) Both Assertion and Reason are false

7. By which of the following conditions is the gender of a child determined? (1)
a) Length of the mother's pregnancy
b) Length of time between ovulation and copulation

c) Presence of an X chromosome in the ovum
d) Presence of a Y chromosome in the sperm

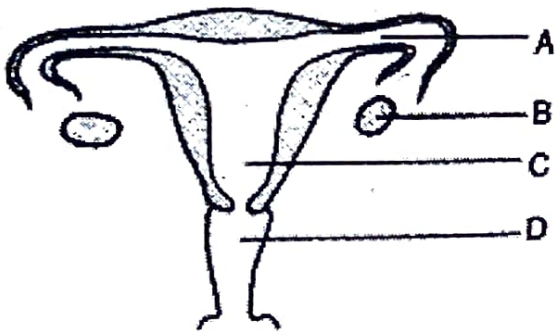
8. In peas, a pure tall plant (TT) is crossed with a pure short plant (tt). The ratio of pure tall plants to pure short plants in F_2 generation will be: (1)

a) 1 : 3 b) 3 : 1
c) 1 : 1 d) 2 : 1

9. Identify the correct option that excretes large amount of nitrogenous waste from a mammalian body. (1)

a) Breath b) Sweat
c) Urine d) Faeces

10. Label the parts A,B,C,D shown in the diagram. (1)



a) A- vagina, B- uterus, C- ovary, D- oviduct
b) A- oviduct, B- ovary, C- uterus, D- vagina
c) A- oviduct, B- uterus, C- vagina, D- ovary
d) A- ovary, B- uterus, C- oviduct, D- vagina

11. Yeast respires using sugar as a substrate. Out of the options given below, choose the correct combination of the condition and product. (1)

Condition	Product
a) Aerobic	Alcohol
b) Aerobic	Lactic Acid
c) Anaerobic	Alcohol
d) Anaerobic	Lactic Acid

12. $4NH_3(g) + 5O_2(g) \rightarrow 4NO(g) + 6H_2O(g)$ (1)

The above reaction is an example of _____.

(i) displacement reaction
(ii) combination reaction
(iii) redox reaction
(iv) neutralisation reaction

a) (i) and (iv)
b) (ii) and (iii)
c) (i) and (iii)
d) (iii) and (iv)

13. Which of the following are exothermic processes? (1)

(i) Reaction of water with quick lime
(ii) Dilution of an acid
(iii) Evaporation of water
(iv) Sublimation of camphor (crystals)

a) (i) and (ii)
b) (ii) and (iii)
c) (i) and (iv)
d) (ii) and (iv)

14. When Ag is exposed to air it gets a black coating of____.(1)

a) $AgNO_3$
b) Ag_2S
c) Ag_2O
d) Ag_2CO_3

15. The electronic configurations of three elements X, Y and Z are X — 2, 8; Y — 2, 8, 7 and Z — 2, 8, 2. Which of the

following is correct? (1)

(a) X is a metal

(b) Y is a metal

(c) Z is a non-metal

(d) Y is a non-metal and Z is a metal

16. Assertion (A) : The metals and alloys are good conductors of electricity. (1)

Reason (R) : Bronze is an alloy of copper and tin and it is not a good conductor of electricity.

a) Both Assertion and Reason are true, and reason is the correct explanation of assertion.

b) Both Assertion and Reason are true, but reason is NOT the correct explanation of assertion.

c) Assertion is true, Reason is false.

d) Assertion is false, but Reason is true.

17. Which of the following are not ionic compounds? (1)

(i) KCl (ii) HCl

(iii) CCl_4 (iv) NaCl

(a) (i) and (ii) (b) (ii) and (iii)

(c) (iii) and (iv) (d) (i) and (iii)

18. Name the type of reaction. (1)

$$CH_4 + Cl_2 \xrightarrow{\text{Sunlight}} CH_3Cl + HCl$$

a) Displacement reaction

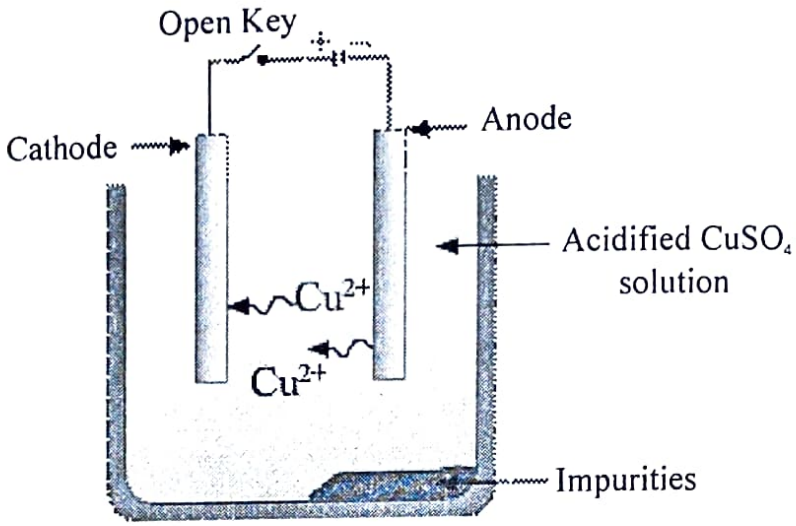
b) Addition reaction

c) Substitution reaction

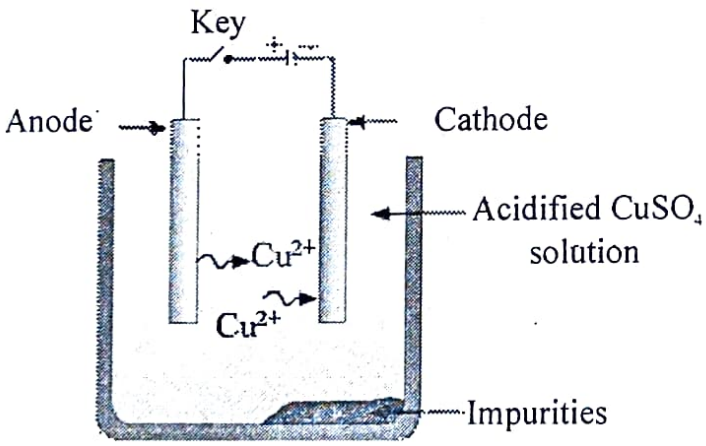
d) Double displacement reaction

19. Identify the figure which describes the process of electrolytic refining of copper? (1)

(a)


Open Key
Anode
Cathode
Acidified $CuSO_4$ solution
Cu^{2+}
Cu^{2+}
Impurities

(b)


Key
Anode
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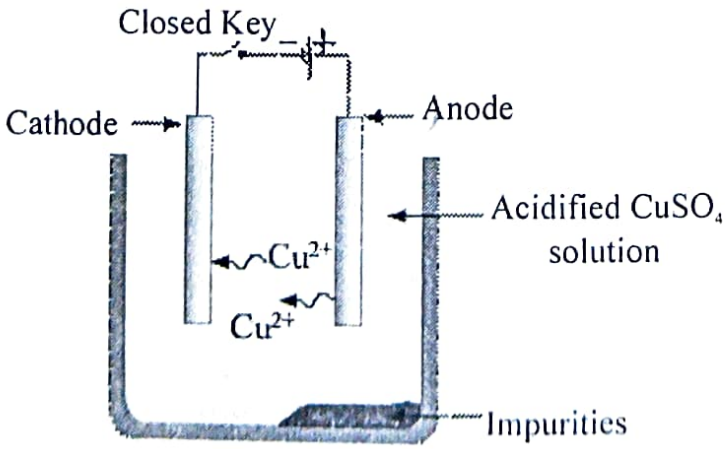
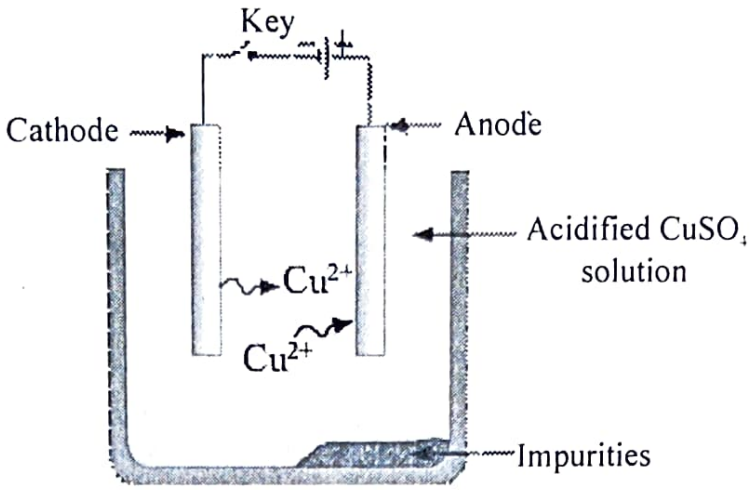
Acidified $CuSO_4$ solution
Cu^{2+}
Cu^{2+}
Impurities

(c)


Closed Key
Cathode
Anode
Acidified $CuSO_4$ solution
Cu^{2+}
Cu^{2+}
Impurities

(d)



20. Copper utensils slowly lose their shiny brown surface and gain a green coat on prolonged exposure to atmospheric air. This is due to the formation of a coating of_____. (1)

a) Copper sulphate
b) Copper carbonate
c) Cupric oxide
d) Cuprous oxide

21. Which one of the following natural sources contains Oxalic acid? (1)

a) Tomato
b) Tamarind
c) Ant sting
d) Nettle sting

22. Complete the reaction and balance it: (1)

$Al_2O_3 + NaOH \rightarrow ... + H_2O$

23. What will be the value and sign of magnification of the image produced when an object is placed at 50cm in front of a plane mirror? (1)

24. The refractive index of A with respect to B is 4/3 and that of B with respect to is 6/7. Find the refractive index of C with respect to A. (1)

25. Define 'Power of Accommodation' for human eye. (1)

26. Draw a ray diagram showing recombination of white light. (1)

27. A child accidently burns a piece of paper, while playing with his father's spectacles by focusing sun rays on the piece of paper. Which eye defect is the father suffering from? Give one reason for this defect. (1)

28. In humans, if gene 'B' gives brown eyes and gene 'b' give blue eyes, what will be the colour of the eyes of the person having the following combination of genes? (1)
a) Bb b) bb

29. Mention the surgical method of birth control
(a) for men (b) for women. (1)

30. What is placenta? Mention its function. (1)

31. What happens when : (1)
a) planaria gets cut into two pieces?
b) sporangia of rhizopus bursts on maturation?

32. Name two organisms in which food material is broken down outside the body and then absorbed. (1)

33. Name the components of tissue which transport soluble products of photosynthesis in a plant. (1)

Section–B (7x2=14)

34. a) Why is electrolysis of brine called 'Chlor-alkali process'? Write the chemical equation involved in this process.

$CuSO_4$

b) A few crystals of hydrated copper sulphate are heated in a dry test-tube. Write any two observations. (2)

35. On adding a few drops of universal indicator in three colourless solutions X, Y and Z taken separately in three test tubes, a student observed the changes in colour as green in X, red in Y and blue in Z.
   a) Arrange X, Y and Z in increasing order of their pH values.
   b) Which one of the three, X, Y and Z, will change the colour of phenolphthalein? Why?

OR

Give reasons for the following :
   a) Most metals are good conductors of electricity.
   b) The reaction of iron (III) oxide [Fe_2O_3] with heated aluminium is used to join cracked machine parts. (2)

36. Why is DNA copying an essential part of the process of reproduction? (2)

37. What is the importance of double circulation in human beings? (2)

38. Why did Mendel select pea plants for conducting his experiments on inheritance? (2)

39. Define Tyndall Effect of Light. How does the particle size affect the colour of scattered light? (2)

40. An object of size 5cm is placed 40cm away from a rear view mirror of radius 30cm. Find the nature, position and size of the image so formed. (2)

OR

Letter 'A' of height 8cm is placed at 10cm in front of a magnifying glass of power 2D. Find the size of the image of the letter 'A'. (2)

Section–C (6x3=18)

41. Draw ray diagrams for the following: (3)
    a) For an object placed at the centre of curvature of a converging mirror.
    b) Stars appear to be higher than they actually are.
    c) Refraction of monochromatic light as it passes through a prism.

42. a) A child cannot read the blackboard clearly sitting beyond 2m from it. Which defect is the child suffering from? Design suitable spectacles to rectify his vision.
    b) What is the cause of dispersion? (3)

43. How do metal carbonates and metal hydrogen carbonates react with acids? Taking magnesium as metal, write balanced chemical equations in both the cases. State the method to test the gas evolved in the reactions. (3)

44. a) Why is Aluminium oxide considered as an amphoteric oxide?
    b) If the atomic numbers of magnesium and oxygen are 12 and 8 respectively, draw their electronic configurations and show the process of formation of their compound by transfer of electrons. (3)

45. Compare the functioning of alveoli in the lungs and nephrons in the kidneys with respect to their structure. (3)

46. What are the adaptations of leaf for photosynthesis? (3)

Section–D (5x3=15)

47. Analyze the following observation table showing variation of image distance (v) with object distance (u) in case of a convex lens and answer the questions that follow without doing any calculations:

S.No.	Object Distance u (cm)	Image Distance v (cm)
1	-100	+25
2	-60	+30
3	-40	+40
4	-30	+60
5	-25	+100
6	-15	+120

a) What is the focal length of the convex lens? Give reason to justify your answer.

b) Write the serial number of the observation which is not correct. On what basis have you arrived at this conclusion?

c) Select an appropriate scale and draw a ray diagram for the observation at S. No 2. Also find the value of magnification. (1+2+2=5)

48. The arrangement of metals in a vertical column in the decreasing order of their reactivity is called the reactivity series or activity series of metals. The most reactive metal is at the top position of the reactivity series. The least reactive metal is at the bottom of the reactivity series.

Hydrogen, though a non-metal, has been included in the activity series of metals only for comparison. Apart from it, the hydrogen atom also has the tendency to lose its valence electron and form cation which behaves like metal.

$$H \rightarrow H^{+} + e$$

(a) Why does calcium start floating when it reacts with water? Write the balanced chemical equation of the reaction.

(b) Name two metals which do not react with water.

(c) An element 'X' displaces iron from the aqueous solution of iron sulphate. List your observations when the element 'X' is treated with the aqueous solutions of copper sulphate, zinc sulphate and silver nitrate. Based on the observations arrange X, Zn, Cu and Ag in increasing order of their reactivities. (2+1+2)

49. Angiosperms are commonly known as flowering plants. The flowering plants reproduce by 'sexual reproduction' method. This means that two sexes (male and female) are involved in reproduction in flowering plants. The sex organs (or reproductive organs) of a plant are in its flowers. In most of the plants, the same flower contains the male organ as well as the female organ. In other words, the majority of plants are bisexual having the male and female reproductive organs in the same plant (or same flower). In fact, the reproductive part of higher plants is the flower. The function of a flower is to make male and female gametes and to ensure that fertilization will take place to make new seeds for the reproduction of plant.

a) Differentiate between cross pollination and self-pollination.

b) Give one example each of:
i) a unisexual flower ii) a bisexual flower

c) Draw a diagram of a flower showing the longitudinal section and label its various parts. (2+1+2=5)