SATLUJ PUBLIC SCHOOL

PRE-BOARD 1 (DECEMBER 2022)

Set-A

SCIENCE (X)

Time: 3 Hours

MM: 80

GENERAL INSTRUCTIONS

(i) The question paper comprises four sections-A, B ,C, D and E. Attempt all the sections

(ii) All questions are compulsory.

(iii) All questions in section A are 1 marks question comprising MCQ and Assertion and reason questions. They are to be answered in one word or one sentence.

(iv) All questions in section B are 2 marks Very short-answer type question. They are to be answered in about 20-30 words

(v) All questions in section C are of 3mks each, short answer type questions. They are to be answered in 50 to 80 words.

(vi) All questions in section D are 5 marks, long answer type question. They are to be answered in about 80-120 words.

(vii) Section E consists of 3 case studies of 4 mks each.

SECTION -A

1. Which of the following is the formula of Butanoic acid?

(a) $CH_3CH_2CH_2CH_2COOH$

(b) $COOH-CH_2-CH_2-CH_2-CH_3$

(c) $CH_3-\underset{\underset{COOH}{|}}{CH}-CH_2-CH_3$

(d) $CH_3-CH_2-CH_2-COOH$

Which one of the following will turn blue litmus red?

) Vinegar b) Lime water c) Baking soda solution d) Washing soda solution

he electrolytic decomposition of water gives H_2 and O_2 in the ratio of:

1:2 by volume b) 2:1 by volume c) 8:1 by mass d) 1:2 by mass

ovalent compounds:

) have high melting and boiling point

b) are mostly soluble in water

c) are formed between atoms of metals and non-metals

d) are formed by the sharing of electrons in the bonding atoms.

5. Vinegar is a solution of:

a) 30% - 40% acetic acid in alcohol b) 5% - 8% acetic acid in alcohol

c) 5% - 8% acetic acid in water d) 15% - 20% acetic acid in water

6. Which of the following metals is present in the anode mud during the electrolytic refining of copper?

a) Sodium b) Aluminium c) Gold d) Iron

7. The laws of reflection are valid for ————.

a) a convex mirror b) a plane mirror c) a concave mirror d) all mirrors irrespective of their shape

8. Concave lens produces ————.

a) only virtual image b) only erect image c) only diminished image d) virtual, erect, and diminished image

9. The change in focal length of the human eye is caused due to ————.

( ) a) Cornea b) Iris c) Ciliary muscles d) Pupil

The crystalline lens of people at old age becomes milky and cloudy; this condition is known as ————.

a) Hypermetropia b) Myopia c) Cataract d) Presbyopia

11. Electrical resistivity of a metallic wire depends upon its ————.

a) Length b) Material c) Thickness d) Shape

12. Tungsten is used in which of the following?

a) Metal extraction b) Electric bulb c) Insulators d) Textile manufacturing

13. Magnetic field is a:

a) Scalar quantity b) Vector quantity c) Dimensionless quantity d) None of these option

14. Overloading happens due to ————.

a) Short circuits b) Decrease in power supply

c) Increase in power supply d) Option (a) and (c)

15. _____ are known as cleaners of nature.

a) Producers b) Decomposers c) Consumers d) Herbivores

16. The SI unit of electric current is ———.

a) Volt b) Faraday c) Ampere d) Ohms

17. Copper and zinc alloy is known as _____

a) Brass b) Bronze c) Duralumin d) Nichrome

Given below are two statement labelled Assertion (A) and Reason (R) Select the correct answer to these questions from code (b) ,(c) and (d).

(a) If both Assertion (A) and reason (R) are true and the Reason (R) is the correct explanation of the Assertion (A)

(b) If both assertion (A) and Reason (R) are true, but reason (R) is not the correct explanation of assertion (A).

(c) if assertion (A) is true but reason (R) is false.

(d) if assertion (A) is false but reason (R) is true.

18. Assertion (A) Butane exhibit isomerism.
Reason (R) Butane is an unsaturated hydrocarbon.

19. Assertion (A) The colour of the blood is red.
Reason (R) it is due to oxidation of haemoglobin with oxygen.

20. Assertion(A): A geneticist crossed two pea plants and got 50% tall and 50% dwarf in the progeny.
Reason (R) : One plant was heterozygous tall and the other was dwarf.

SECTION –B

21. What happened when small piece of sodium is droped in ethanol? List your observation with the help of reaction
OR
What is the internal energy reserve in plants? Do the animals have same energy reserve?

22. What type of coating is formed on silver and copper articles when they get corroded ?

23. a) What is synapse?
b) Define reflex action.
OR
What are decomposers? List two important roles they play in the environment.

24. Write two differences between binary fission and multiple-fission in a tabular form.

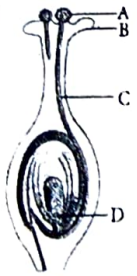
25. a) If the image formed by mirror for all positions of the object placed in front of it is always diminished erect and virtual. State the type of mirror and draw the ray diagram.
b) Write the relation between v, u and f for a spherical mirror.

26. The absolute refractive indices of glass and water are 4/3 and 3/2 respectively. If the speed of light in glass is 2×10^8 m/s, calculate the speed of light in (i) vacuum, (ii) water.
OR
The refractive indices of glass and water with respect to air are 3/2 and 4/3 respectively. If speed of light in glass is 2×10^8 m/s, find the speed of light in water.

SECTION -C

27. What are plant hormones? Name the plant hormones responsible for the following:
(i) Growth of stem
(ii) Promotion of cell division
(iii) Inhibition of growth
OR
Write the chemical formula of Bleaching powder. How is bleaching powder prepared? For what purpose is it used in drinking water?

28. List three techniques that have been developed to prevent pregnancy. Which one of these techniques is not meant for males? How does the use of these techniques have a direct impact on the health and prosperity of a family?
OR
(b)

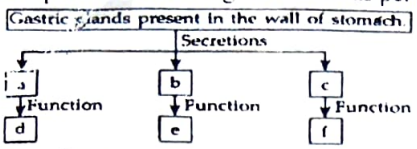


(i) Name the part marked A in the diagram.
(ii) How does A reaches part B?
(iii) State the importance of the part C.
(iv) What happens to the part marked D after fertilisation is over?

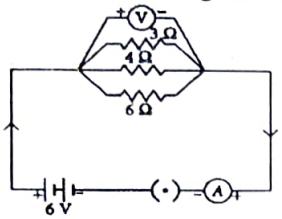
29. (A) An aldehyde as well as a ketone can be represented by the same molecular formula, say C_3H_6O. Write their structures and name them. State the relation between the two in the language of science.
(B) Draw the structure for ethanoic acid molecule, CH_3COOH.

A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4 cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror? Also calculate the size of the image formed.

Complete the following flow chart as per the given instructions.



32. State ohms law. Represent it graphically. In the given circuit diagram calculate
(i) the total effective resistance of the circuit.
(ii) the current through each resistor.



33. A current carrying conductor is placed in a magnetic field. Now answer the following.
(i) List the factors on which the magnitude of force experienced by conductor depends.
(ii) When is the magnitude of this force maximum?
(iii) State the rule which helps, in finding the direction of motion of conductor.
(iv) If initially this force was acting from right to left, how will the direction of force change if
(a) direction of magnetic field is reversed?
(b) direction of current is reverse

OR

A person is suffering from both myopia and hypermetropia:
(i) What kind of defect he is suffering from?
(ii) How is this defect corrected?

(b) A person needs a lens of power +3 D for correcting his near vision and -3 D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects.

SECTION D

35. Give reasons:
(a) Ventricles have thicker muscular walls than atria.
(b) Transport system in plants is slow.
(c) Circulation of blood in aquatic vertebrates differs from that in terrestrial vertebrates.
(d) During the daytime, water and minerals travel faster through xylem as compared to the night.
(e) Veins have valves whereas arteries do not.

OR

35. (a) Why is there a difference in the rate of breathing between aquatic organisms and terrestrial organisms? Explain.
(b) Draw a diagram of human respiratory system and label – pharynx, trachea, lungs, diaphragm and alveolar sac on it.

36. (A) What are alloys? How are they made? Name the constituents and uses of brass, bronze and solder.
(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.

OR

Lead nitrate solution is added to a test tube containing potassium iodide solution.
(a) Write the name and colour of the compound precipitated.
(b) Write the balanced chemical equation for the reaction involved.
(c) Name the type of this reaction justifying your answer.
(d) How is sodium bi carbonate made? Give its one use also.

37. A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other.
(a) List your observations regarding:
(i) Colour of stem in their F_1 progeny
(ii) Percentage of brown stemmed plants in F_2 progeny if plants are self pollinated.
(iii) Ratio of GG and Gg in the F_2 progeny.
(b) Based on the findings of this cross, what conclusion can be drawn?

SECTION -E

CASE STUDY I

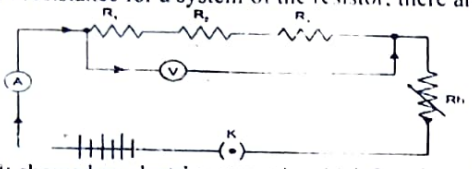
If the body design in the squirrel relied only on electrical impulses via nerve cells, the range of tissues instructed to prepare for the coming activity would be limited. On the other hand, if a chemical signal were to be sent as well, it would reach all cells of the body and provide the wide ranging changes needed. This is done in many animals, including human beings, using a hormone called adrenaline that is secreted from the adrenal glands.

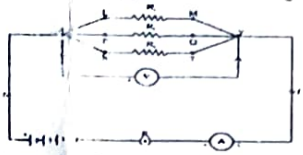
i) Which is the target organ for the adrenaline hormone?
ii) Which hormone is released by thyroid gland?
iii) What is the function of thyroxine hormone?
iv) Name the hormone released by ovary?

CASE STUDY II

Read the following and answer the questions:

In resistance for a system of the resistor, there are two methods of joining the resistors together as shown below:





It showed an electric current in which 3 resistors having resistors R_1, R_2 and R_3 respectively are joined end to end i.e series. While th combination of the resistor in which 3 resistors are connected together which points X and Y are said to be parallel

(I) The total potential difference across a combination of a resistor in series is equal to:
a) $V_1 + V_2 + V_3$ b) $V_1 = V_2 + V_2$ c) $V_1 + V_2$ d) None of these

(II) In a series combination of resistors, the current is:
a) same at every point of the circuit b) different at every point of the circuit
c) zero d) cannot be determined

(III) The electrical energy disputed in the resistor is given by
a) W = VIT b) W = VIR c) W = RIT d) W = RT

(IV) If 5 resistors, each of value 0.2 ohm are connected in series what will be the resultant resistance:
a) 1 ohm b) 10 ohm c) 6 ohm d) 8 ohm

CASE STUDY III

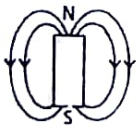
A magnetic field is described by drawing the magnetic field lines. When a small north magnetic pole is placed in the magnetic field created by a magnet, it will experience a force. And if the north pole is free, it will move under the influence of magnetic field. The path traced by a north magnetic pole free to move under the influence of a magnetic field is called a magnetic field line. Since the direction of magnetic field line is the direction of force on a north pole, so the magnetic field lines always begin from the N-pole of a magnet and end on the S-pole of the magnet. Inside the magnet, however the direction of magnetic field lines is from the S-pole of the magnet to the N-pole of the magnet. Thus, the magnetic field lines are closed curves. When a small compass is moved along a magnetic field line, the compass needle always sets itself along the line tangential to it. So, a line drawn from the south pole of the compass needle to its north pole indicates the direction of the magnetic field at that point.

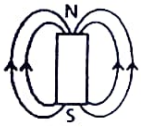
(i) The magnetic field lines
a) intersect at right angle to one another b) intersect at an angle of 45° to each other
c) do not cross one another d) cross at an angle of 60° to one another.

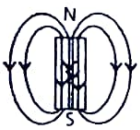
(ii) A strong bar magnet is placed vertically above a horizontal wooden board. The magnetic lines of force will be
a) only in horizontal plane around the magnet
b) only in vertical plane around the magnet
c) in horizontal as well as in vertical planes around the magnet
d) in all the planes around the magnet.

(iii) Magnetic field lines can be used to determine:
a) the shape of the magnetic field
b) only the direction of the magnetic field
c) only the relative strength of the magnetic field
d) both the direction and the relative strength of the magnetic field.

(iv) The magnetic field lines due to a bar magnet are correctly shown in figure:

(a) 

(b) 

(c) 

(d)