Maximum Marks: 80 **Class X – Science** **Times Allowed: 3 Hours**

General Instructions:

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

(ii) Section A-question no. 1 to 20 – all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer question and assertion- reason type question. Answers to these should be given in one word or one sentence.

(iii) Section B- question no 21-26 are short answer type questions, carrying 2 marks each.

Answer to these questions should in the range of 30 to 50 *words.*

(iv) Section C- question no. 27 to 33 is short answer type questions. Carrying 3 marks each.

Answer to these questions should in the range of 50 to 80 *words.*

(v) Section D- question no. 34 to 36 is long answer type questions. Carrying 5 marks each.

Answer to these questions should in the range of 80 to 120 *words*

(vi) There is no overall choice. However, internal choices have been provided in some questions.

A student has to attempt only one of the alternatives in such questions.

(vii) Wherever necessary, neat and properly labeled diagrams should be drawn.

SECTION – A

1. Identify the oxidising agent and the substance oxidised in the following reaction. [1]

   $CuO + H_2 \rightarrow Cu + H_2O$

2. Why is sodium kept immersed in kerosene oil? [1]
3. Consider the following statements with regard to periodic classification of elements. [1]

   A. In Modern Periodic Table, the isotopes of an element having different mass numbers are put at one place in the same group.
   B. Elements in Mendeleev's Periodic Table are arranged on the basis of increasing atomic numbers.
   C. Elements in the Modern Periodic Table are arranged on the basis of increasing mass numbers.
   D. In the Modern Periodic Table, nickel of a lower mass no. is kept after cobalt of higher mass number.

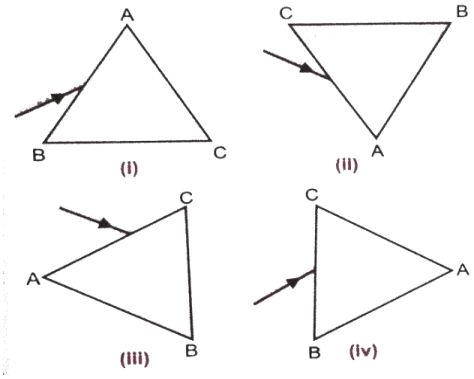
   The correct statements are

   (a) A and B (b) B and C

   (c) C and D (d) A and D

4. On which factor does the colour of the scattered white light depend? [1]

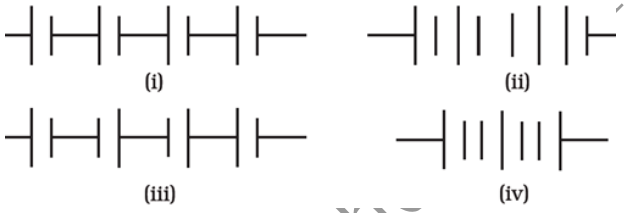
5. A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident the prism shown in Figure. In which of the following cases, after dispersion, the third colour from the top corresponds to the colour of the sky?



a. (i) c. (iii)

b. (ii) d. (iv) [1]

6. The proper representation of series combination of cells obtaining maximum potential is



a. (i) c. (iii) [1]

b. (ii) d. (iv)

OR

Which of the following represents voltage?

a. $\frac{Work\ done}{Current \times Time}$ c. $\frac{Work\ done \times Time}{Current}$

[1]

b. Work done × Charge d. $\frac{Work\ done \times Change}{Time}$

7. What is the maximum resistance which can be made using five resistors each of 1/5 Ω ?

(i) $\frac{1}{5}\ \Omega$ c. (iii) 5 Ω [1]

(ii) 10 Ω d. (iv) 1 Ω

8. Choose the incorrect statement from the following regarding magnetic lines of field?

a. The direction of magnetic field at a point is taken to be the direction in which the north pole of a magnetic compass needle points.

b. Magnetic field lines are closed curves.
c. Magnetic field lines are parallel and equidistant, they represent zero field strength.
d. Relative strength of magnetic field is shown by the degree of closeness field lines.

[1]

OR

Which of the following property of a proton can change while it moves freely in a magnetic field?

(There may be more than correct answer)

a. Mass c. Velocity

[1]

b. Speed d. Momentum

9. Name the physical quantity which is same in all the resistors in all the resistors when they are connected in Series. [1]

OR

Should the resistance of voltmeter be low or high? [1]

10. Having observed and studied the prepared slides of Amoeba and yeast for asexual reproduction, students made following conclusions. The correct conclusion is: [1]
(a) both reproduce by binary fission
(b) both reproduce by budding
(c) Amoeba reproduces by binary fission and yeast by budding
(d) Amoeba reproduces by budding and yeast by binary fission

OR

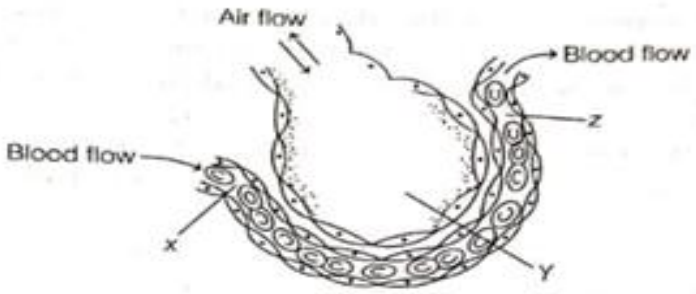
The mature embryo of dicotyledonous seed has two cotyledons, the radical and the plumule. Which one of this tissue is not produced from the embryonic mass? [1]
(a) Plumule (b) hypocotyls (c) root tip (d) cotyledons

11. How is the wall of small intestine adapted for performing the function of absorption of food? [1]
12. Give reason why a food chain cannot have more than four trophic levels. [1]
13. State the role of pancreas in digestion of food. [1]
14. Veins are thin walled and have valves. Justify. [1]
15. Veins are thin walled and have valves. Justify. [1]
16. Explain how ozone being a deadly poison can still perform an essential function for our environment. [1]

Answers Q. Nos. 17-18 Contain five sub-parts each. You are expected to answer any four sub parts in these questions.

17. Read the following and answer any four questions from (i) to (v). [1× 4]

With the lungs, the passage divides into small tubes which finally terminate in balloon-like structures which are called alveoli. The alveoli provide a surface where the exchange of gases can take place. The walls of alveoli contain an extensive network of blood vessels. As we breathe in, we life our ribs and flatten our diagraph and the chest cavity becomes large lift.



What are the oxygen concentrations in *X*, *Y* and *Z*?

	X	*Y*	*Z*
(a)	High	Low	High
(b)	High	Low	Low
(c)	Low	High	High
(d)	Low	High	Low

(ii) Which of the following is characteristic of emphysema?
- (a) destruction of alveolar walls
- (b) increase in the growth of lung tissue
- (c) inflammation of the walls of the bronchi
- (d) thickning of the artery walls to the lungs

(iii) Chemicals in tobacco smoke lead to the breakdown of the elastic tissue in the alveoli What is the name of this condition?
- (a) bronchitis
- (b) emphysema
- (c) heart disease
- (d) lung cancer

(iv) What is the percentage of oxygen in expired air when a person is resting?
- (a) 8%
- (b) 16%
- (c) 12%
- (d) 20%

(v) What happens during the process of breathing in?

	External intercostal muscles	**Diaphragm**
(a)	Contract	Arches
(b)	Contract	Flattens
(c)	Relax	Arches
(d)	Relax	Flattens

18. Read the following and answer any four questions from (i) to (v). [1× 4]

From the position of the aluminum (AI) metal in the activity series, it seems to be quite reactive. However, it is not so reactive. Actually, when the metal is kept in air or oxygen for sometimes, it is converted into its oxide (Al_2O_3)

This gets deposited as the surface of metal as a thin coating. It is rather passive which means that it is not reactive. Therefore, that metal is used for packing food articles which do not get spoiled under the foil.

(i) Which is the correct order of reactivity series?

(a) Mg < Ca < Na < K (c) K < Mg < Na < Ca

(b) K < Na < Ca < Mg (d) Mg < Ca < Na < K

(ii) Choose the correct match from the following :

A. Sodium	(i) Quick lime
B. Aluminium	(ii) Keep in kerosene
C. Calcium	(iii) Wraping food

A. (i), (ii),(iii) C. (iii), (i), (ii)

B. (ii),(iii),(i) D. (ii),(i),(iii)

(iii)

(iii) What is the reaction of quick lime into slaked lime?

(a) $CaO + CO_2 \xrightarrow{\Delta} CaCO_3$ (b) $Ca(OH)_2 \xrightarrow{\Delta} CaO + H_2O$

(c) $CaO + H_2O \longrightarrow Ca(OH)_2 + \Delta$ (d) $C + O_2 \xrightarrow{\Delta} CO_2$

(iv) Why we wear ornaments of gold and silver?

(a) They are expensive, to look rich

(b) They are most reactive

(c) They are least reactive

(d) None of the above

(v) The gas evolved from slaked lime, is ..... in nature.

(a) acidic (b) amphoteric

(c) basic (d) All of these

19. Using the given part of the periodic table, answer any four questions given below with reason. [4]

Group → Period ↓	1	2	13	14	15	16	17	18
3	X		B	C	D	E		
4	Y							
5	Z							

a. Which of these elements have smallest atomic size?

(i) B (iii) D

(ii) C (iv) E

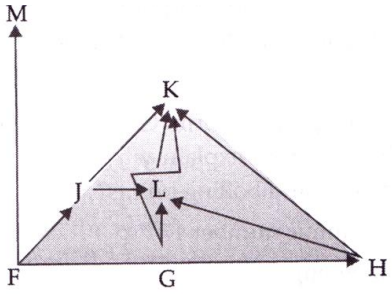
b. Write electronic configuration of element E.

c. Identify the elements which have similar physical and chemical properties as the element Y.

d. The number of period that the modern periodic table has
   (i) Seven (iii) Seventeen
   (ii) Eight (iv) Eighteen

e. An element 'A' belongs to the third period and group 16 of the periodic table. Find out the valency of A?
   (i) Valency = 6 (iii) valency = 1
   (ii) valency= 2 (iv) valency = 3

20. Read the following and answer any four questions from (i) to (v). [1× 4]



(a) Which of these is the producer?
   (i) K (ii) L
   (iii) J (iv) G

(b) Which organisms are primary consumers?
   (i) F, L, H, K (ii) M, K, J, H
   (ii) J, L, K, M (iv) F, K, M, H

(c) Which organisms will receive maximum energy in the ecosystem?
   (i) M (ii) K
   (iii) G (iv) None of these

(d) Which organisms represent top level carnivores?
   (i) K (ii) M
   (iii) G (iv) Both (i) and (ii)

(e) What will happen if we kill all the organisms in one trophic level ?
   (i) Population of organisms in previous trophic level will increase.
   (ii) Population of organism in previous trophic level will decrease.
   (iii) Population of organism in next trophic level will increase.
   (iv) This will not affect the population of any trophic level.

SECTION – B

21. State in brief the preparation of washing soda from baking soda. Write balanced chemical equation of the reaction involved. [2]
22. List two differences between metal and nonmetal on the basis of their chemical properties. [2]
23. What is DNA copying? State its importance in the reproduction of sexually reproducing organisms. [2]
24. Write two main differences between an acid and a base? [2]
25. On entering in a medium from air, the speed of light becomes half of value in air. Find the refractive index of that medium with respect to air. [2]

26. State one difference between kilowatt and kilowatt hour? Express 1 kWh in joules. [2]

OR

A bulb is rated 5V; 500 mA. Calculated the rated power and resistance of the bulb when it glows.

SECTION – C

27. An element X is placed in the thirteenth group and third period of the Modern Periodic Table. Answer the following questions starting the reason in each case. [3]

    A. Write the electronic configuration of X.
    B. Write the formula of the compound formed when the element X reacts with another element Y of atomic number
    C. Will the oxide of the element X be acidic or basic?

28. Why does the pH of the mouth change after taking meals? What harm is associated with it and how can it be overcome? [3]
29. Atoms of seven elements A, B, C, D, E, F and G have a different number of electronic shells but have the same number of electrons in their outermost shells. The elements A and C combine with chlorine to form an acid and common salt respectively. The oxide of element A is a liquid at room temperature and is a neutral substance, while the oxides of the remaining six elements are basic in nature. Based on the above information answer the following questions.

    i. What could the element A be?
    ii. Will elements A to G belong to the same period or same group of the periodic table?
    iii. Write the formula of the compound formed by the reaction of element A with oxygen. [3]

30. Explain how the exchange of gases occurs in plants across the surface of stems, roots and leaves. [3]

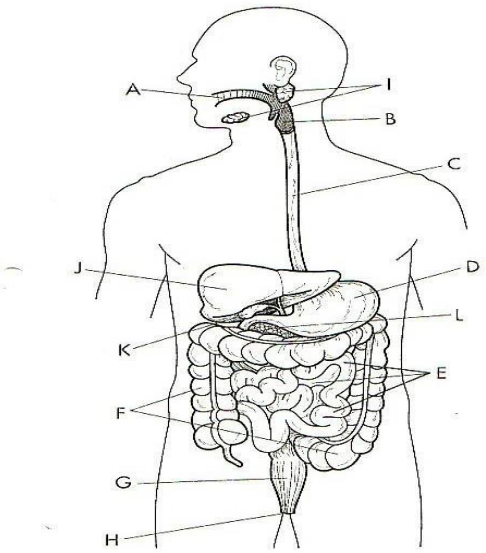
31. Illustrate with the help of a suitable diagram, Binary Fission in Amoeba. [3]
32. What is meant by power of lens? Write the S.I. unit? A student uses lens of focal length 40 cm and another of -20 cm. Write the nature and power of each lens? [3]
33. What is meant by power of a lens? Write the SI unit? A students uses a lens of focal length 40 cm and another of – 20 cm. Write the nature and power of each lens? [3]

SECTION – D

34. **.** Explain the following: [5]

    a. Reactivity of aluminum decreases if it is dipped in HNO3.
    b. Carbon cannot reduce the oxides of Na or Mg.
    c. NaCl is not a conductor of electricity in solid state whereas it does conduct electricity in aqueous solution as well as in molten state.
    d. Iron articles are galvanized.
    e. Metals like Na, K, Ca and Mg are never found in their free state in nature.

35. a) Leaves of a healthy potted plant were coated with Vaseline. Will this plant remain healthy for long? Give reasons for your answer. [5]



b) How is the process of transpiration useful to plant?

c) Identify the following parts of the human alimentary canal, labelled: C, J, F, D.

36. A student wants to project the image of a candle flame on the walls of the school laboratory by using a mirror.

(a) Which type of mirror should he use and why? [5]

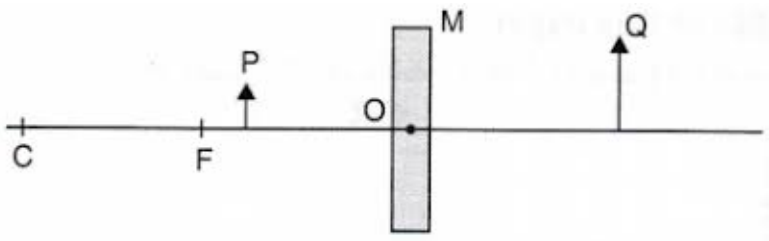
(b) At what distance in terms of focal length 'f of the mirror should he place the candle flame so as to get the magnified image on the wall

(c) Draw a ray diagram to show the formation of image in this case.

(d) Can he use this mirror to project a diminished image of the candle flame on the same wall? State 'how if your answer is 'yes' and 'why not if your answer is 'no'.5

OR

a. Define the following terms in the context of spherical mirrors: [5]
   (i) Pole (iii) Principle axis
   (ii) Centre of curvature (iv) Principle focus
b. Draw ray diagram to show the Principle focus of a :
   (i) Concave mirror (ii) Convex mirror
c. Consider the following diagram in which M is a mirror and P is an object and Q is its magnified image formed by the mirror.



State the type of the mirror M and one characteristic property of the image Q.