



INDIAN SCHOOL SOHAR
PERIODIC TEST III (2019 -20)
SUBJECT: SCIENCE

CLASS: X

Max. Marks: 80

DATE: 7/01/2020

Duration: 3Hrs

General Instructions:-

1. The question paper comprises of **three** Sections - **A, B** and **C**. Attempt **all** the sections.
2. The question paper consists of a total of 30 questions. **All** questions are compulsory.
3. All questions in Section **A** are **one-** mark questions comprising of MCQ, VSA type and assertion and reasoning type questions. They are to be answered in one word or in one sentence.
4. All questions in Section **B** are **three-**mark short-answer type questions. These are to be answered in about 50-60 words each.
5. All questions in Section **C** are **five-**mark, long-answer questions. These are to be answered in about 80-90 words each.
6. Internal choice is given in each section.
7. Wherever necessary the diagrams drawn should be neat and properly labelled.

SECTION A

1. Write the name and structural formula of the first member of the homologous series of alkynes. 1
2. Write any two limitations of Newlands Law of Octaves. 1
3. **Answer question numbers 3(a) - 3(d) on the basis of your understanding of the following paragraph and the related studied concepts.**



In a process called nuclear fission, the nucleus of a heavy atom (such as uranium, plutonium or thorium), when bombarded with low-energy neutrons, can be split apart into lighter nuclei. When this is done, a tremendous amount of energy is released if the mass of the original nucleus is just a little more than the sum of the masses of the individual products. The fission of an atom of uranium, for example, produces 10 million times the energy produced by the combustion of an atom of carbon from coal. In a nuclear reactor designed for electric power generation, such nuclear 'fuel' can be part of a self sustaining fission chain reaction that releases energy at a controlled rate. The released energy can be used to produce steam and further generate electricity. In a nuclear fission, the difference in mass, Δm , between the original nucleus and the product nuclei gets converted to energy E at a rate governed by the famous equation, $E = \Delta m c^2$, first derived by Albert Einstein in 1905, where c is the speed of light in vacuum. In nuclear science, energy is often expressed in units of electron volts (eV): $1 \text{ eV} = 1.602 \times 10^{-19}$ joules. It is easy to check from the above equation that 1 atomic mass unit (u) is equivalent to about 931 mega electron volts (MeV) of energy.

- 3(a) Mention two major hazards of nuclear power generation? 1
- 3(b) Is there any other possibility of nuclear energy generation other than fission which releases tremendous amount of energy, but leave little nuclear waste? 1
- 3(c) The spent Uranium (used fuels) is still decaying into harmful subatomic particles (radiations), such as Alpha radiations, which has positive charge. If a magnetic field is established in order to deflect alpha particles to the right of their path, what should be the direction of magnetic field? 1
- 3(d) In nuclear fission, the nucleus of Uranium is bombarded with low-energy neutrons. Can neutrons be deflected by a magnetic field ? Justify. 1

4. Answer question numbers 4(a)-4(d) on the basis of your understanding of the following paragraph and the related studied concept.

The thyroid gland is a small butterfly-shaped gland in the neck, just in front of the windpipe (trachea). It controls key functions of the human body. It produces hormones that play important roles in the chemical processes that occur in the body. Calcitonin is a hormone that is produced in humans by the parafollicular cells of the thyroid gland. Calcitonin helps to regulate levels of calcium and phosphate in the blood, opposing the action of parathyroid hormone. Several different disorders can arise, when our thyroid gland produces too much hormone (hyperthyroidism) or not enough (hypothyroidism). Although the effects can be unpleasant or uncomfortable, most thyroid problems can be managed well if properly diagnosed and treated.

- 4(a) Name the main hormone produced by the thyroid gland other than calcitonin. 1
- 4(b) What is the role played by the above hormone in the human body? 1
- 4(c) Which among the following should be added to the diet of a person with enlarged thyroid gland?
i) Spinach ii) Baking soda iii) iodised salt iv) green leafy vegetables. 1
- 4(d) Sita visited the doctor complaining about difficulty in breathing and swallowing. On examination the doctor noticed that her neck was swollen and advised her to conduct the hormone test and ultrasonography of the thyroid gland. Name the disease that she is likely to suffer from. 1
5. A student sitting on the last bench can read the letters written on the blackboard but is not able to read the letters written in his text book. Which of the following statements is correct?
i) The near point of his eyes has receded away
ii) The near point of his eyes has come closer to him
iii) The far point of his eyes has come closer to him
iv) The far point of his eyes has receded away.

OR

When light rays enter the eye, most of the refraction occurs at the

- i) crystalline lens ii) outer surface of the cornea iii) iris iv) pupil. 1
6. What is the minimum resistance which can be made using five resistors of $1/5 \Omega$ each?
i) $1/5 \Omega$ ii) $1/25 \Omega$ iii) $1/10 \Omega$ iv) 25Ω . 1
7. A full length image of a distant tall building can definitely be seen by using
i) a concave mirror ii) a convex mirror
iii) a plane mirror iv) both concave as well as plane mirror. 1
8. The element which was named as Eka-silicon is:
i) Gallium ii) Scandium iii) Germanium iv) Aluminium. 1

9. Which of the statements about the reaction given below are incorrect?



p) Lead is getting reduced

q) CO_2 is getting oxidized

r) Carbon is getting oxidized

s) Lead oxide is getting reduced

i) p & q

ii) p & r

iii) p, q & r

iv) r & s.

1

10. Which of the following is an alkali?

i) CaCO_3

ii) NaHCO_3

iii) NaOH

iv) Na_2CO_3 .

1

11. Which fossil fuel is generally referred to as clean fuel?

i) coal

ii) petroleum

iii) natural gas

iv) gasoline.

1

12. Which of the following is not a greenhouse gas?

i) water vapour

ii) carbon dioxide

iii) sulphur dioxide

iv) methane

OR

Which of the following is a water harvesting structure used in Rajasthan?

i) Khadins

ii) Bundhis

iii) Ahars

iv) Kattas.

1

For question numbers 13 and 14, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below.

i) Both **A** and **R** are true and **R** is the correct explanation of the Assertion.

ii) Both **A** and **R** are true but **R** is not the correct explanation of the Assertion.

iii) **A** is true but **R** is false.

iv) **A** is false but **R** is true.

13. **Assertion:** For a current in a long straight solenoid N- and S-poles are created at the two ends.

Reason: The N- and S-poles exchange position when the direction of current through the solenoid is reversed.

1

14. **Assertion:** Esters are formed by the reaction of acids and alcohols.

Reason: Esters are sweet smelling substances.

1

SECTION B

15. (i) Which acid is stronger, the one with pH=5 or pH=2? Justify your answer.

(ii) Give the chemical name and formula of bleaching powder. Write the equation to show its formation.

OR

How is Plaster of Paris chemically different from gypsum? How can these two chemicals be interconverted? Write two uses of Plaster of Paris.

3

16. Write a balanced chemical equation with state symbols for the following reactions:

(i) Solutions of barium chloride and Sodium sulphate in water react to give insoluble barium sulphate and the solution of Sodium chloride.

(ii) Sodium hydroxide solution (in water) reacts with hydrochloric acid solution (in water) to produce sodium chloride solution and water.

3

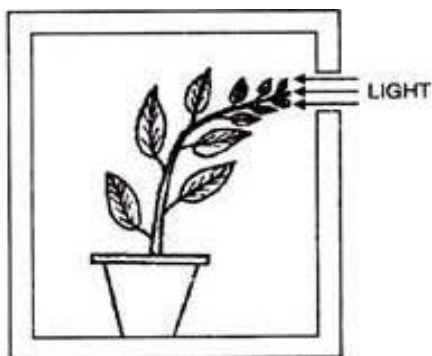
17. Compare the alveoli in the lungs and nephrons in the kidneys with respect to their structure and function. (Any three points)

3

18. (i) Create a terrestrial food chain depicting four trophic levels.
 (ii) Why is a short food chain more favourable than a long food chain?

OR

- (i) 'Damage to the ozone layer is a cause for concern'. Justify this statement.
 (ii) Suggest any two steps to be taken to limit this damage. 3
19. In a Mendelian cross, tall pea plants with purple flowers were crossed with dwarf pea plants with white flowers to get the F1 progeny. Later, the F1 progeny was selfed to obtain F2 progeny. Answer the following questions by showing the cross.
 (i) The genotype of two parents.
 (ii) The genotype and phenotype of F1 progeny.
 (iii) The phenotypic ratio obtained in F2 progeny. 3
20. The figures given below show two types of plant movements.
 (i) State the stimulus which is responsible for movement in both the cases.
 (ii) Give suitable scientific terms for these two types of movements.
 (iii) How do these movements differ from each other with respect to growth? 3



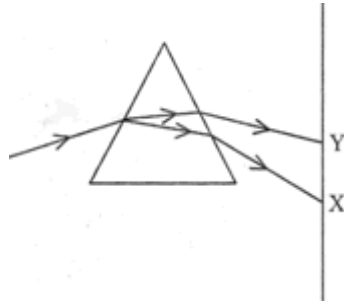
21. In the following table, the positions of six elements A, B, C, D, E and F are shown as they are in the Modern Periodic Table:

| GROUP → | 1 | 2 | 3 - 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|----------|---|---|--------|----|----|----|----|----|----|
| ↓ PERIOD | | | | | | | | | |
| 2 | A | | | B | | C | | | D |
| 3 | | | | | E | | | | F |

On the basis of the above table, answer the following questions:

- Name the element which forms only covalent compounds.
- Name the element which is a metal with valency three.
- Name the element which is a non-metal with valency three.
- Out of B and C, whose atomic radius is bigger and why?
- Write the common name of the family in which the elements D and F belong. 3

22. (i) Explain with the help of a labelled diagram, the distribution of magnetic field due to current flowing through a circular loop.
 (ii) A coil of N turns produces a magnetic field, N times more than that produced by a single turn inside it. Why? 3
23. (i) How can solar energy be harnessed?
 (ii) Mention any two limitations in using solar energy. 3
24. In the figure given below, a narrow beam of white light passes through a triangular glass prism. After passing through the prism, it produces a spectrum XY on the screen.



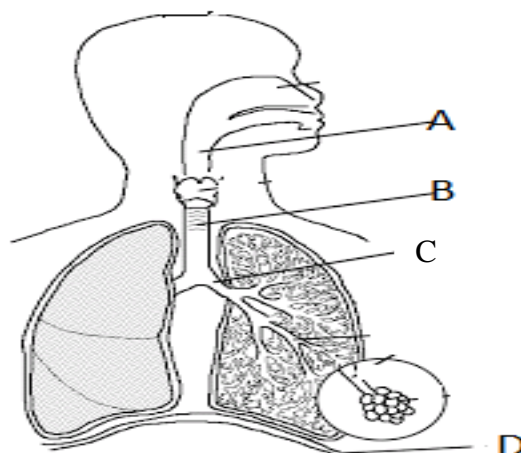
- (i) Name the phenomenon.
 (ii) State the colours seen at X and Y.
 (iii) Why do colours of white light bend at different angles through a prism?

OR

- (i) What is a visible spectrum?
 (ii) Why is red light used as the stopping light at traffic signals?
 (iii) Two triangular glass prisms are kept together by joining their rectangular side and a light beam is passed through one side of the combination. Will there be any dispersion? 3
 Justify your answer.

SECTION C

25. (i) What is hydrogenation reaction? Write an equation to represent this reaction. How is the reaction useful in vegetable ghee industry?
 (ii) Distinguish between ethanol and ethanoic acid on the basis of their chemical properties.
 Name the oxidizing agent used in the conversion of ethanol to ethanoic acid. 5
26. Study the figure given below and answer the following questions:



- (i) Identify the parts labelled as A, B, C & D.
 (ii) Why do lungs always contain residual volume of air?
 (iii) How is oxygen and carbon dioxide transported in human beings? 5

27. (i) Define vegetative propagation.
(ii) Name any two plants that grow naturally through vegetative propagation.
(iii) State any three advantages of vegetative propagation.

OR

- (i) Draw a neat diagram of the Female Reproductive System and label the following parts:
a) Where the female germ cell is formed
b) Where fertilised embryo gets implanted
c) Where fertilisation occurs
d) Where the uterus opens into the vagina.
(ii) State the role of placenta in the development of an embryo inside the mother's body. (Two points) 5

28. (i) In the formation of a compound between two atoms A and B, A loses two electrons and B gains one electron.
a) What is the nature of bond formed between A and B?
b) Suggest the formula of the compound formed by the reaction of A and B atoms.
(ii) Show the formation of $MgCl_2$ molecule.
(iii) Common salt conducts electricity only in the molten state. Why?
(iv) Why is the melting point of NaCl high?

OR

- (i) Give reason:
a) Carbon is not used to reduce the oxides of sodium or aluminium.
b) An iron strip dipped in blue copper sulphate solution turns the blue solution to pale green.
(ii) Name two metals which react violently with cold water. Write any two observations you would make when such a metal is dropped into water. Name and identify the gas evolved during the reaction. 5

29. (i) State Ohm's law? Is it applicable in all conditions?
(ii) A current of 1 ampere flows in a series circuit containing an electric lamp and a resistor of $5\ \Omega$ is connected to a 10 V battery. Calculate the resistance of the electric lamp.
(iii) If a resistor of $10\ \Omega$ is connected in parallel with the above series combination, what change will be shown in the current flowing through (a) $5\ \Omega$ resistor and (b) the potential difference across the lamp? Give reasons. 5

30. Soumya needs a lens of power -4.5 D for correcting her vision.
(i) What kind of defect in vision is she suffering from?
(ii) What is the focal length and nature of the corrective lens?
(iii) Draw ray diagrams showing the defect of the eye and correction for this defect.
(iv) What are the causes of this defect? (Any 2 points)

OR

- (i) State the laws of refraction.
(ii) On entering in a medium from air, the speed of light becomes half of its value in air. Find the refractive index of that medium with respect to air.
(iii) A ray of light incident on a slab made up of a material with refractive index n_1 , is kept in a medium of refractive index n_2 . Draw the path of the rays of light emerging from the glass slab, if (i) $n_1 > n_2$ (ii) $n_1 = n_2$ (iii) $n_1 < n_2$. 5
