

CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-19

Time : 3 Hours

Maximum Marks : 80

General Instructions :

- (i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
- (ii) All questions are compulsory.
- (iii) Internal choice is given in each sections.
- (iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
- (v) All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.
- (vi) All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.
- (vii) This question paper consists of a total of 30 questions.

SECTION A

Q1. Name the part of the human eye where image of an object is formed. Write one characteristic (real, virtual, erect, inverted) of the image. [1]

Q2. Define speciation. [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**

Ozone or tri-oxygen is an inorganic molecule with the chemical formula O_3 . It is a pale bluish gas with a distinctively pungent smell. Ozone is an allotrope of oxygen and is less stable than oxygen. Although ozone is a poisonous gas but at higher levels of the atmosphere (in stratosphere) it acts as a protective blanket. It absorbs the harmful ultraviolet rays from reaching the earth's surface. It was found that this layer is depleting day by day due to the changes in human lifestyle.

Chemicals released into the atmosphere from aerosol repellents, refrigerators, air conditioners, etc. are the main causes of depletion of ozone layer.

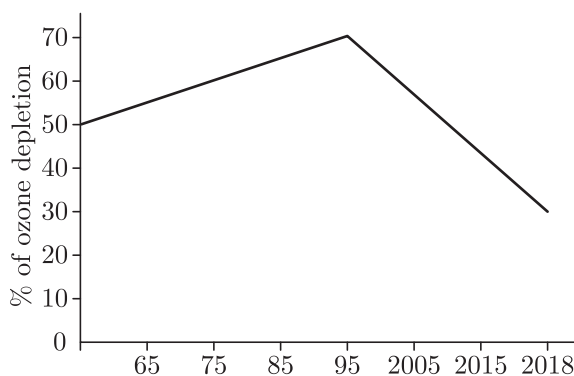
3.1 Name the chemical which is mainly responsible for the depletion of ozone layer. [1]

3.2 Scientists say that there is a hole in ozone layer. Is there actually a hole in ozone layer? Why do they say so? [1]

3.3 Name the component required for the conversion of O_2 into O_3 . [1]

3.4 Study the graph given alongside.

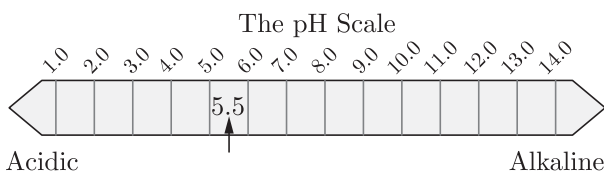
It indicates that the depletion of ozone layer is reducing after 1995. What may be the probable reason behind it? [1]



Q4. Answer question numbers 4.1-4.4 on the basis of your understanding of the following paragraph and related studied concepts.

Children eat a lot of sugary foods such as cakes, pastries, chocolates etc. which can lead to tooth decay. Tooth decay is the gradual destruction of hard outer tissues of the tooth that leads to the formation of cavities or caries in tooth.

Whenever we eat any food, some of the food particles stick in-between our teeth. The bacteria present in our mouth break down the sugar present in the food to form acid. This acid changes the pH of the mouth which may be the main cause of tooth decay.



4.1 What is meant by saying that pH change may be the main cause of tooth decay? [1]

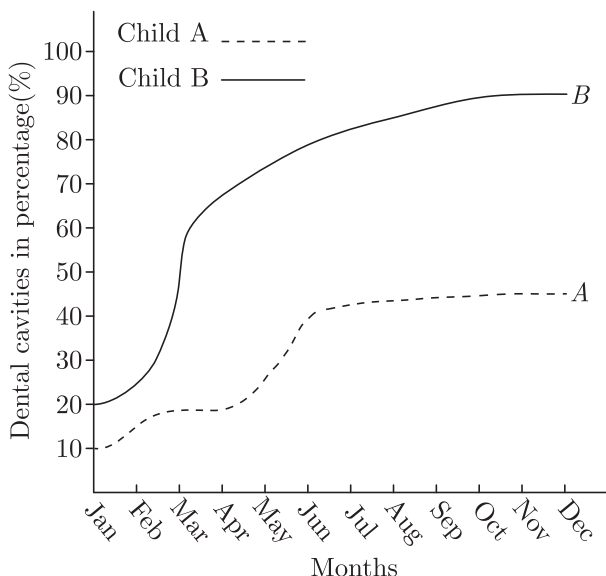
4.2 What is the critical pH at which tooth decay starts? [1]

- (a) 5.5
- (b) 7
- (c) 8.8
- (d) 9

4.3 The nature of the toothpaste used for cleaning teeth is [1]

- (a) acidic
- (b) basic
- (c) neutral
- (d) corrosive

4.4 Based on the data shown in the graph below, which of the two children A and B, would have more teeth with cavities and why? [1]



Q5. Consider the following statements about the characteristics of genes: [1]

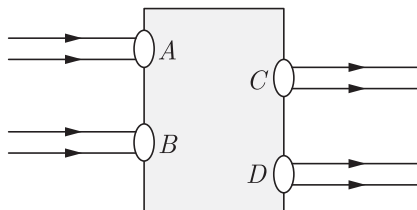
- A. Genes are specific sequence of bases in a DNA molecule.
- B. A gene does not code for proteins.
- C. In individuals of a given species, a specific gene is located on a particular chromosome.
- D. Each chromosome has only one gene.

The correct statements that describe the characteristics of genes are

- (a) A, B and C
- (b) B, C and D
- (c) A and C only
- (d) B and D only

- Q6. An ohmic conductor of circular cross-section has a resistance R . If it is melted and recast to half of its length with rectangular cross-section, its new resistance will be [1]
 (a) $2R$ (b) R
 (c) $\frac{R}{2}$ (d) $\frac{R}{4}$

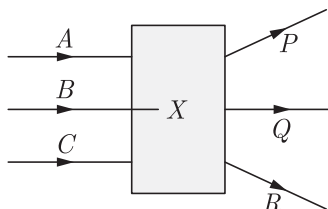
- Q7. Beams of light are incident through the holes A and B and emerging out of box through the holes C and D respectively as shown in the figure. Which of the following could be inside the box? [1]



- (a) A rectangular glass slab (b) A convex lens
 (c) A concave lens (d) A prism

OR

- Light rays A, B and C fall on an optical device X and come out as P, Q and R. This optical device is a [1]



- (a) concave lens. (b) convex lens.
 (c) glass slab. (d) glass prism.

- Q8. A shiny-brown substance X on heating in air turns black and a new compound Y is formed. Name the substance X and black compound Y. [1]
 (a) $X = Fe$ and $Y = FeO$
 (b) $X = Cu$ and $Y = Cu(OH)_2$
 (c) $X = Cu$ and $Y = CuO$
 (d) $X = Al$ and $Y = Al_2O_3$

- Q9. Consider the following statements: [1]

- 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. If 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 of the field lines.

The correct statements are

- (a) A and B only (b) C and D only
 (c) A, B and C (d) A, B and D

- Q10. The defect of vision which arises due to gradual weakening of the ciliary muscles, and diminishing flexibility of the eye lens is [1]
 (a) presbyopia (b) myopia
 (c) hypermetropia (d) cataract

OR

The defect of vision in which the crystalline lens at old age becomes milky and cloudy is called [1]

- (a) cataract (b) presbyopia
(c) myopia (d) colour blindness

Q11. 'Atomic number is the fundamental property of an element'. Name the scientist who proposed it. [1]

- (a) Bohr (b) Newlands
(c) Mendeleev (d) Moseley

Q12. The part of the human eye where most of the refraction of the light rays entering the eye occurs is [1]

- (a) crystalline lens
(b) outer surface of the cornea
(c) outer surface of pupil
(d) iris

OR

When ciliary muscles are relaxed, focal length of eye lens is

- (a) maximum
(b) minimum
(c) Neither maximum nor minimum
(d) Cannot say

For question numbers 13 and 14, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true and R is correct explanation of the assertion.
(b) Both A and R are true but R is not the correct explanation of the assertion.
(c) A is true but R is false.
(d) A is false but R is true.

Q13. **Assertion :** Isotopes of an element are placed in the same position in Modern Periodic Table.

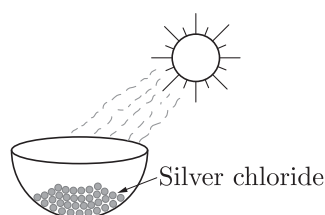
Reason : The electronic configuration of all isotopes of an element is same. [1]

Q14. **Assertion :** Our main aim of conservation should be to preserve the biodiversity.

Reason : Loss of biodiversity may lead to loss of ecological stability. [1]

SECTION B

Q15. The following diagram displays a chemical reaction. Observe it carefully and answer the following questions: [3]



- (a) Identify the type of chemical reaction that will take place in this case and define it. How will the colour of the salt change?
(b) Write the chemical equation of the reaction that takes place.

OR

What is an exothermic reaction? Why is respiration considered an exothermic reaction? Explain. [3]

- Q16. (a) Write the name given to bases that are highly soluble in water. Give an example.
(b) Name the major constituents of soda acid fire extinguisher. Write the chemical reaction taking place in it
(c) Why does bee-sting cause pain and irritation? Rubbing of baking soda on the sting area gives relief. Why? [3]
- Q17. Write the number of periods in the Modern Periodic Table. State the change in valency and metallic character of elements as we move from left to right across a period. Also state the change, if any, in the valency and atomic size of elements as we move down a group. [3]
- Q18. (a) State the role performed by plant hormones. Name a plant hormone which is essential for cell division.
(b) Name and explain the role of plant hormone involved in phototropism. [3]
- Q19. (a) Identify the glands that secrete
(i) insulin
(ii) thyroxin
(b) Explain with an example how the timing and the amount of hormones secreted are regulated by the human body. [3]
- Q20. List in tabular form, two distinguishing features between the acquired traits and the inherited traits with one example of each. [3]

OR

- (a) Planaria, insects, octopus and vertebrates all have eyes. Can we group eyes of these animals together to establish a common evolutionary origin? Justify your answer.
(b) "Birds have evolved from reptiles". State evidence to prove the statement. [3]
- Q21. With the help of a labelled diagram, explain why the sun appears reddish at the sunrise and the sunset. [3]
- Q22. Define a solenoid. With the help of a suitable diagram show the pattern of magnetic field lines in and around a current carrying solenoid. State the region where field is uniform. [3]
- Q23. State the factors on which the strength of an electromagnet depends. Differentiate between an electromagnet and a permanent magnet. List three uses of electromagnets. [3]

OR

With the help of a diagram, describe an activity to draw magnetic field lines around a bar magnet. [3]

- Q24. Name the major component of biogas. List two advantages of using biogas over fossil fuels. What is the use of the residual slurry? [3]

SECTION C

- Q25. Describe an activity with diagram to illustrate that the reaction of metal carbonates and metal bicarbonates with acids produces carbon dioxide. Write the relevant equations of all the reactions that take place. Name any two forms in which calcium carbonate is found in nature. [5]

OR

- (a) What is corrosion of metals? Name a metal which does not corrode and the one which corrodes when exposed to the atmosphere.
- (b) How will you show that rusting of iron needs oxygen and moisture at the same time? 5

Q26. Explain why carbon forms compounds mainly by covalent bond. Explain in brief two main reasons for carbon forming a large number of compounds. Why does carbon form strong bonds with most other elements? [5]

- Q27. (a) Draw a sectional view of the human alimentary canal and label the following parts:
- (i) Oesophagus
 - (ii) Liver
 - (iii) Stomach
 - (iv) Pancreas
- (b) What is peristalsis?
- (c) What would happen if mucus is not secreted by the gastric glands? [5]

- Q28. (a) Write the functions of the following in human female reproductive system:
Ovary, Oviduct, Uterus
- (b) What is placenta? State its major role in case of a pregnant human female. [5]

OR

State the method of reproduction followed by human beings. Name and explain with a labelled sketch the function of various parts of the human male reproductive system. [5]

- Q29. (a) State the laws of refraction of light. Explain the term “absolute refractive index of a medium” and write an expression to relate it with the speed of light in vacuum.
- (b) The absolute refractive indices of two media A and B are 2.0 and 1.5 respectively. If the speed of light in medium B is 2×10^8 m/s, calculate the speed of light in:
- (i) vacuum
 - (ii) medium A [5]

OR

“A convex lens can form a magnified erect as well as magnified inverted image of an object placed in front of it.” Draw ray diagrams to justify this statement stating the position of the object with respect to the lens in each case.

An object of height 4 cm is placed at a distance of 20 cm from a convex lens of focal length 10 cm. Use lens formula to determine the position of the image formed. 5

- Q30. (a) Two identical resistors each of resistance 10Ω are connected in (i) series and (ii) parallel to a 6 V battery. Calculate the ratio of power consumed in the combination of resistors in two cases.
- (b) Draw the circuit diagram of the two cases. [5]

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