Practice Paper 2

Class X 2023-24

Science (086)

Time: 3 Hours

General Instructions:

- 1. This question paper consists of 39 questions in 5 sections.
- 2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- 3. Section A consists of 20 Objective Type questions carrying 1 mark each.
- 4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
- 5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.
- 6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- 7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions 1 - 20.

1.



Which of the following angles are correctly marked in the above ray diagram?

- (a) $\angle i, \angle A$ and $\angle D$
- (b) Only $\angle i$ and $\angle A$
- (c) $\angle i, \angle r \text{ and } \angle A$
- (d) All of the angles
- 2. Which of the following property is generally not shown by metals?
 - (a) Electrical conduction
 - (b) Sonorous in nature
 - (c) Dullness
 - (d) Ductility

Max. Marks: 80

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- 3. A highly reactive element (X) reacts with oxygen of air even at room temperature to give an oxide (Y). The oxide (Y) is soluble in water. The aqueous solution of (Y) does not change the colour of red litmus solution but reacts with an aqueous solution of sodium hydroxide. Here X is-
 - (a) sodium
 - (b) phosphorus
 - (c) carbon
 - (d) sulphur
- 4. Choose the form in which most of the plants absorb nitrogen from the atmosphere?
 - (a) Proteins
 - (b) Amino acids
 - (c) Atmospheric nitrogen
 - (d) Nitrates and nitrites
- 5. The clear sky appears blue as shown in the figure because



- (a) blue light gets absorbed in the atmosphere
- (b) ultraviolet radiations are absorbed in the atmosphere
- (c) violet and blue lights get scattered more than lights of all other colours by the atmosphere
- (d) light of all other colours is scattered more than the violet and blue colour lights by the atmosphere
- 6. Which of the following is/are correct for olfactory indicators?
 - 1. Their colour changes with acid or base.
 - 2. Onion, vanilla or clove are examples.
 - (a) Only 1
 - (b) Only 2
 - (c) Both 1 and 2
 - (d) Neither 1 nor 2
- 7. What causes cramps in our muscles during sudden activity?
 - (a) The pyruvate gets converted into lactic acid to release of energy.
 - (b) The pyruvate gets converted into carbon dioxide to release of energy.
 - (c) The pyruvate gets converted into ethanol to release of energy.
 - (d) The pyruvate gets converted into glucose to release of energy.

- 8. Chlorine reacts with saturated hydro-carbons at room temperature in the
 - (a) absence of sunlight
 - (b) presence of sunlight
 - (c) presence of water
 - (d) presence of hydrochloric acid
- 9. An incident ray strikes a concave mirror after passing through the focus (F) as shown in the figure.



Which of the following shows the correct path of reflected rays?



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10. Oxygen gas reacts with hydrogen to produce water. The reaction is represented by the equation: $O_2(g) + H_2(g) \longrightarrow H_2O(I)$

The above reaction is an example of

- 1. Oxidation of hydrogen
- 2. Reduction of oxygen
- 3. Reduction of hydrogen
- 4. Redox reaction
- (a) 1, 2 and 3
- (b) 2, 3 and 4
- (c) 1, 3 and 4
- $(d) \quad 1,\,2 \text{ and } 4$
- 11. The shape of guard cells changes due to change in the



- (a) protein composition of cells
- (b) temperature of cells
- (c) amount of water in cells
- (d) position of nucleus in the cells

12. The number of pair(s) of sex chromosomes in the zygote of humans is

- (a) one
- (b) two
- (c) three
- (d) four
- **13.** What happens when copper rod is dipped in iron sulphate solution?



- (a) Copper displaces iron
- (b) Blue colour of copper sulphate solution is obtained
- (c) No reaction takes place
- (d) Reaction is exothermic
- 14. A dilute ferrous sulphate solution was gradually added to the beaker containing acidified permanganate solution. The light purple colour of the solution fades and finally disappears.

Which of the following is the correct explanation for the observation?

- (a) $KMnO_4$ is an oxidising agent, it oxidises $FeSO_4$.
- (b) $FeSO_4$ acts as an oxidising agent and oxidises $KMnO_4$.
- (c) The colour disappears due to dilution; no reaction is involved.
- (d) $KMnO_4$ is an unstable compound and decomposes in presence of $FeSO_4$ to a colourless compound.
- **15.** Consider the following statements about refraction of light :



1. The incident ray, refracted ray and the normal ray lie in the same plane.

2. The angle of incidence is equal to the angle of refraction.

Choose the correct option from the codes given below:

- (a) Only 1
- (b) Only 2
- (c) Both 1 and 2
- (d) Neither 1 nor 2
- 16. Offspring formed by asexual method of reproduction have greater similarity among themselves because
 - (i) asexual reproduction involves only one parent
 - (ii) asexual reproduction does not involve gametes
 - (iii) asexual reproduction occurs before sexual reproduction
 - (iv) asexual reproduction occurs after sexual reproduction
 - (a) (i) and (ii)
 - (b) (i) and (iii)
 - (c) (ii) and (iv)
 - (d) (iii) and (iv)

Question no. 17 to 20 are Assertion - Reasoning based questions.

- **17.** Assertion : A chemical reaction becomes faster at higher temperatures.
 - Reason : At higher temperatures, molecular motion becomes more rapid.
 - (a) Both Assertion and Reason are True and Reason is the correct explanation of the Assertion.
 - (b) Both Assertion and Reason are True but Reason is not the Correct explanation of the Assertion.
 - (c) Assertion is True but the Reason is False.
 - (d) Both Assertion and Reason are False.
- **18. Assertion :** Abscisic acid is a stress hormone.

Reason : Stimulation of ABA occurs in adverse conditions.

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

19. Assertion : Interventricular septum separates left from right atrium.

Reason : Interventricular septum separates left from right ventricle.

- (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 but Reason is false.
- (d) Assertion is false but Reason is true.

20. Assertion : When a battery is short-circuited, the terminal voltage is zero.

Reason : In the situation of a short-circuit, the current is zero

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

SECTION-B

Question no. 21 to 26 are very short answer questions.

21. What would you observe when zinc is added to a solution of iron(II) sulphate ? Write the chemical reaction that takes place.

or

Name two metals that catch fire when put in water and why ?

- 22. When your finger is accidentally pricked by a needle, you instantaneously withdraw your hand. Which parts of your nervous system are involved in this response ?
- **23.** What are the various situations about the variations?

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- 24. Leaves of Bryophyllum fallen on the ground produce new plants, whereas the leaves of Jasmine do not. Why ?
- 25. Two lenses of power -2.5 D and +1.5 D are placed in contact. Find the total power of the combination of lenses. Calculate the focal length of this combination.

or

An object placed at a distance of 30 cm infront of a convex mirror of focal length 15 cm. Write four characteristics of the image formed by the mirror.

26. Define food chain and write its two functions.

SECTION-C

Question no. 27 to 33 are short answer questions.

- 27. Which compounds are called (i) alkanes, (ii) alkenes and (iii) alkynes? C_4H_{10} belongs to which of these? Draw two structural isomers of this compound.
- 28. Write and balance the following questions presented to you as written statements :
 - (i) Magnesium carbonate plus hydrochloric acid produces magnesium chloride plus water plus carbon dioxide gas.
 - (ii) Aluminium plus chlorine gas produces aluminium trichloride.
 - (iii) Nitrogen plus hydrogen produces ammonia.
- **29.** (a) Define hormone. Write four characteristics in humans.
 - Name the disorder caused by the following situations :
 - (i) Under secretion of growth hormone
 - (ii) Over secretion of growth hormone
 - (iii) Under secretion of insulin
 - (iv) Deficiency of iodine.

(b)

or

Name any three endocrine glands in human body and briefly write the function of each of them.

- **30.** A person wears spectacles of power -2.5 D. Name the defect of vision he is suffering from. Draw the ray diagram for (i) the defective eye, (ii) its correction after using a suitable lens.
- **31.** Study the diagram below and answer the following questions :



- (i) Name the defect of vision depicted in the diagram.
- (ii) List two causes of the above defect.
- (iii) Draw a ray diagram for the correction of the above defect using an appropriate lens.

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32. Draw a circuit diagram of an electric circuit containing a cell, a key, an ammeter, a resistor of 4Ω in series with a combination of two resistors (8Ω each) in parallel and a voltmeter across parallel combination. Each of them dissipate maximum energy and can withstand a maximum power of 16W without melting. Find the maximum current that can flow through the three resistors.

or

Derive an expression for equivalent resistance when two resistors of resistance R_1 and R_2 are connected in parallel.

33. How do organisms, whether reproduced asexually or sexually maintain a constant chromosome number through several generations? Explain with the help of suitable example.

SECTION-D

Question no. 34 to 36 are Long answer questions.

- **34.** Explain the following :
 - (i) Metals at the top of the reactivity series do not occur in the free state in nature.
 - (ii) Finely powdered ore is mixed with a suitable oil and water in the concentration of a sulphide ore.
 - (iii) Sulphide ores need to be roasted after concentration.
 - (iv) Mercury can be obtained just by roasting the ore.
 - (v) Highly reactive metals are obtained by electrolytic reduction of their compounds.

or

- (a) Define corrosion.
- (b) What is corrosion of iron called ?
- (c) How will you recognise the corrosion of silver ?
- (d) Why corrosion of iron is a serious problem ?
- (e) How can we prevent corrosion of iron ?
- **35.** (a) State any two changes seen in boys at the time of puberty.
 - (b) Define fertilization and implantation.
 - (c) State the role of ovary and fallopian tube in human body.

or

- (a) Write the functions of the following parts in human female reproductive system :(i) Ovary, (ii) Oviduct, (iii) Uterus.
- (b) Write the structure and function of placenta.
- **36.** (i) Consider a conductor of resistance R, length L, thickness d and resistivity ρ . Now this conductor is cut into four equal parts. What will be the new resistivity of each of these parts? Why?
 - (ii) Find the resistance if all of these parts are connected in:
 - (a) Parallel
 - (b) Series
 - (iii) Out of the combinations of resistors mentioned above in the previous part, for a given voltage which combination will consume more power and why?

SECTION-E

Question no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

- **37.** Baking soda is used in small amounts for making bread and cakes. It helps to make these soft and spongy. An aqueous solution of baking soda turns red litmus blue. It is also used in soda acid fire extinguisher. Use this information to answer the following questions.
 - (i) Write the equation for the reaction between baking soda and acid.
 - (ii) How does it help in extinguishing fire?
 - (iii) What is the reaction involved when it is heated?

or

- (iv) Is the pH value of baking soda solution lower than or higher than 7?
- **38.** In our country, ultrasound imaging (echography) is used to take images of the developing babies (foetus). It is considered safe for both the mother and the foetus. In this method, the doctor holds a probe and moves it across the abdomen of the mother.

Ultrasound waves which are transmitted into the abdomen are reflected from the surface of the foetus. These reflected waves are picked up by the probe and relayed to a machine that produces the image of the developing baby. In some parts of our country, ultrasound is done illegally.

- (i) What could be the reason of performing ultrasound illegally?
- (ii) "Man, and not the woman is responsible for the birth of a girl child." What is meant by this statement?
- (iii) Can ultrasound examination of expecting mothers answer the following questions? Write 'Yes' or 'No'.
 - (a) What is the colour of the baby's eyes?
 - (b) Is there more than one foetus?

or

(iv) Based on the data shown in the graph alongside, state what could be the reason for the decline in the boys child sex ratio ?



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39. The lens of the eye does little of the bending of the light rays. Most of the refraction is done at the front surface of the cornea which also acts as a protective covering. The lens acts as a fine adjustment for focussing at different distances. This is accomplished by the ciliary muscle, which change the curvature of the lens so that its focal length is changed. To focus on a distant object, the muscles are relaxed and the lens is thin and parallel rays focus at the focal point (on the retina). To focus on a nearby object, the muscles contract, causing the centre of the lens to be thicker, thus shortening the focal length so that images of nearby objects can be focused on the retina, behind the focal point. This focusing adjustment is called accommodation.

The closest distance at which the eye can focus clearly is called the near point of the eye. A given person's far point is the farthest distance at which an object can be seen clearly. To check your own near point, place this book close to your eye and slowly move it away until the type is sharp.

A large part of the population have eyes that do not accommodate within the normal range of 25 cm to infinity, or have some other defect. Two common defects are near-sightedness and far-sightedness. Both can be corrected to a large extent with lenses–either eyeglasses or contact lenses.

- (i) The ciliary muscle muscles of a normal eye are in their (i). most relaxed (ii). most contracted state. In which of the two cases is the focal length of the eye-lens more ?
- (ii) What is the least distinct of vision of young man?
- (iii) What is persistence of vision ?

or

(iv) What is meant by power of accommodation of the eye?