

Class 10 Science Question Paper 2023-24

Max. Marks: 80

Time Allowed: 3 hours

General Instructions:

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

Section-A

Select and write the most appropriate option out of the four options given for each of the questions 1-20. There is no negative mark for incorrect response.

1. Chemically rust is

(a) hydrated ferrous oxide (b) only ferric oxide (c) hydrated ferric oxide (d) none of these

2. Dilute hydrochloric acid is added to granulated zinc taken in a test tube. The following observations are recorded. Point out the correct observation.

- (a) The surface of metal becomes shining
- (b) The reaction mixture turns milky
- (c) Odour of a pungent smelling gas is recorded
- (d) A colourless and odourless gas is evolved

3. One cell-thick vessels are called

- a) Arteries
- b) Veins
- c) Capillaries
- d) Pulmonary artery

4. IUCD is for

- a. Vegetative propagation
- b. Contraception
- c. Increasing fertility
- d. Avoiding miscarriage

5. Which is denatured spirit?

- a) ethanol only
- b) ethanol and methanol (50%)
- c) ethanol and methanol (5%)
- d) methanol only

6. On immersing an iron nail in CuSO_4 solution for a few minutes, you will observe

- A) No reaction takes place
- B) The colour of solution fades away
- C) The surface of iron nails acquires a black coating
- D) The colour of solution changes to green

7. Height of a plant is regulated by:

- a) DNA which is directly influenced by growth hormone.
- b) Genes which regulate the proteins directly.
- c) Growth hormones under the influence of the enzymes coded by a gene.

d) Growth hormones directly under the influence a gene.

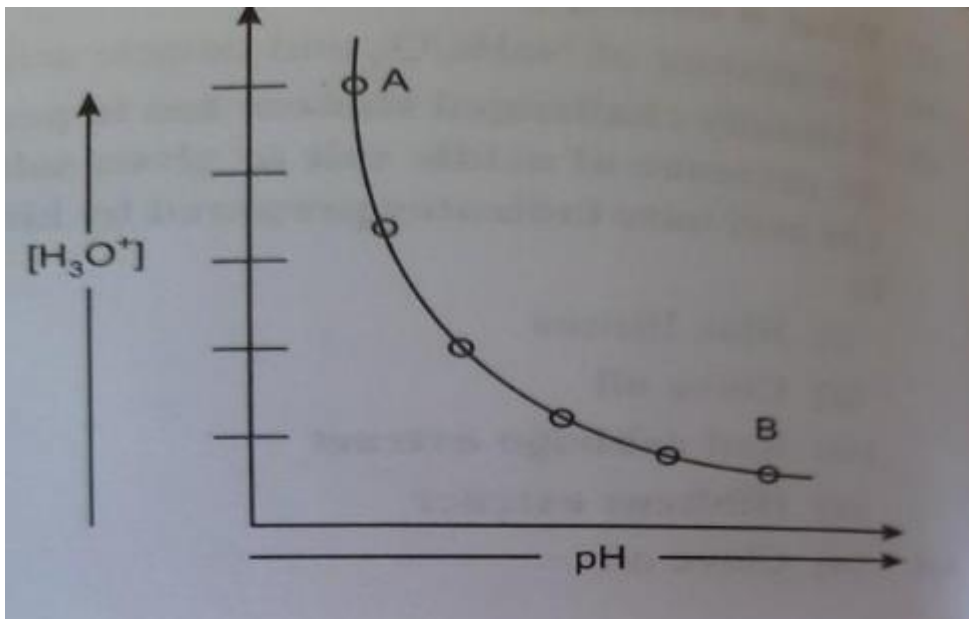
8. Which one is a possible progeny in F₂ generation of pure bred tall plant with round seed and short plant with wrinkled seeds?

- a. Tall plant with round seeds
- b. Tall plant with wrinkled seeds
- c. Short plant with round seed
- d. All of the above

9. When Barium Chloride and Sodium Sulphate Reacts, the product formed is

- a) A gas
- b) An insoluble precipitate
- c) A soluble precipitate
- d) An aqueous solution

10. The following graph represents variation of hydronium ions with pH. What can be inferred from the following?



- a. The concentration of both decreases
- b. Concentration of H_3O^+ increases with increasing pH
- c. Concentration of H_3O^+ increases with decreasing pH level
- d. The pH is constant

11. Which option is the formula for butanoic acid

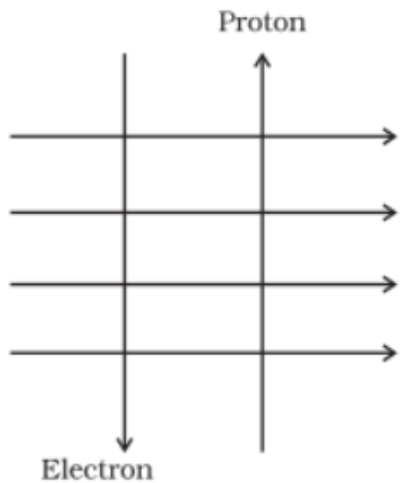
- (a) $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{COOH}$
 (b) $\text{COOH} - \text{CH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CH}_3$
 (c) $\text{CH}_3 - \underset{\text{COOH}}{\text{CH}} - \text{CH}_2 - \text{CH}_3$
 (d) $\text{CH}_2 - \overset{\text{COOH}}{\text{CH}_2} - \text{CH}_2 - \text{COOH}$

12. 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 textbook. Which of the following statements is correct?

- (a) The near point of his eyes has receded away
 (b) The near point of his eyes has come closer to him
 (c) The far point of his eyes has come closer to him
 (d) The far point of his eyes has receded away

13. A uniform magnetic field exists in the plane of paper pointing from left to right as shown in Figure. In the field an electron and a proton move as shown. The electron and the proton experience

- (a) forces both pointing into the plane of paper
 (b) forces both pointing out of the plane of paper
 (c) forces pointing into the plane of paper and out of the plane of paper, respectively
 (d) force pointing opposite and along the direction of the uniform magnetic field, respectively



14. Electrical resistivity of a given metallic wire depends upon

- (a) its length**
- (b) its thickness**
- (c) its shape**
- (d) nature of the material**

15. A successful forest conservation strategy should involve

- (a) protection of animals at the highest trophic level**
- (b) protection of only consumers**
- (c) protection of only herbivores**
- (d) comprehensive programme to protect all the physical and biological components**

16. In a neuron, the conversion of electrical signal to a chemical signal occurs at/in

- (a) cell body**
- (b) axonal end**
- (c) dendritic end**
- (d) axon**

17. Assertion(A): The effect of auxin hormone on the growth of root is exactly opposite to that on a stem.

Reason (R) : Auxin hormone increases the rate of growth in root and decreases the rate of growth in stem.

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

18. Assertion (A) : A cell is a device which converts chemical energy into electrical energy.

Reason (R) : Cell maintains a constant potential difference between its terminals for a long time.

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

19. Assertion (A) : MgCl₂ is a covalent compound.

Reason (R) : MgCl₂ is a good conductor of electricity in molten state

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

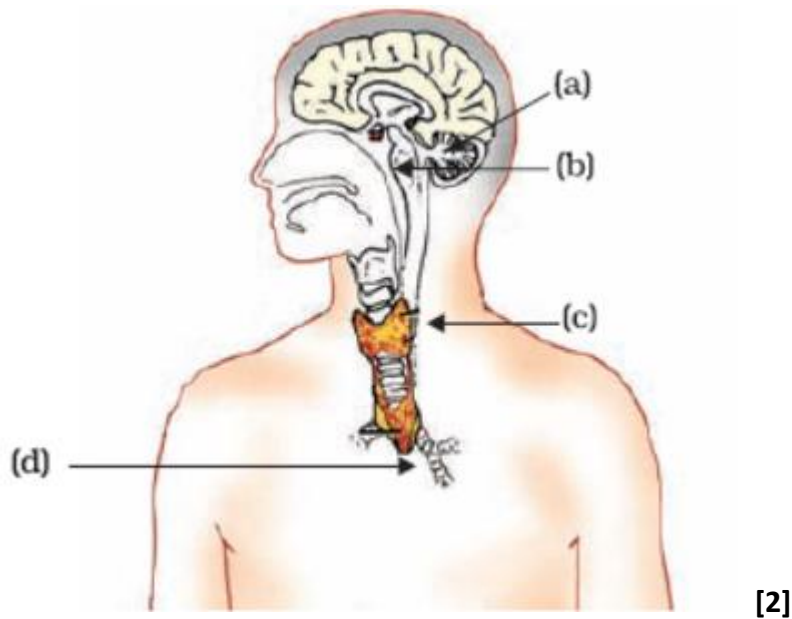
20. Assertion: The concentration of harmful chemicals is least in human beings.

Reason: Man is at the apex of the food chain.

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

Very Short Answer Questions (6x2=12)

21. Label the following endocrine glands as shown in Fig:



22. Fig A

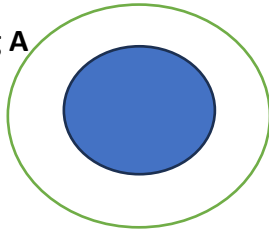
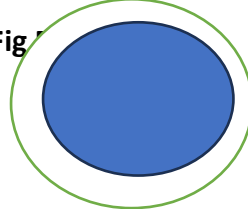


Fig B



Identify the blood vessel type given in Fig A and Fig B and differentiate between them. [2]

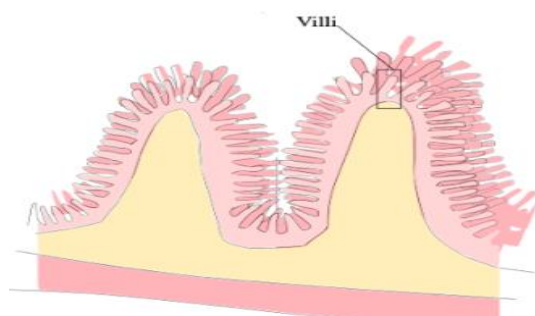
23. How does dilution affect the pH of an acid? [2]

24. How does use of a fuse wire protect electrical appliances? [2]

25. Why does the sky appear blue? [2]

26. Two lamps, one rated 100 W at 220 V, and the other rated 60 W at 220 V, are connected in parallel to electric mains supply. What current is drawn from the line if the supply voltage is 220 V? [2]

Short Answer Questions: [7X3=21]



27 a. Identify the structure shown in the figure above. [1]

b. What is the function of the given structure? [2]

28.a. What is the difference between the movement of food in alimentary canal and movement of leg? [2]

or

. Explain the role of the mouth in digestion of food.

b. What is the cause of variation in Progeny? [1]

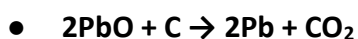
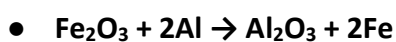
29. a) The electronic configurations of three elements X, Y and Z are X — 2, 8; Y — 2, 8, 7 and Z — 2, 8, 2. Which two can form ionic compound? Show with a Lewis structure. [2]

b. How can rusting be prevented?

Or

What is the usefulness of an alloy? (1)

30.a. Identify the oxidizing agent and reducing agent in the following reactions: [2]



b. What will be the colour change of Phenolphthalein when tested with the product formed by the reaction of Water and Potassium?

31. a] Explain the phenomenon shown in the following diagram



[2]

Or

Draw refraction through a glass slab.

b. How is hypermetropia corrected? [1]

32. (a) What is meant by a magnetic field? Mention two parameters that are necessary to describe it completely. [2]

(b) If field lines of a magnetic field are crossed at a point, what does it indicate? [1]

Or

Why does the current carrying solenoid when suspended freely rests along a particular direction?

33.a) In the following food chain, plants provide 500 J of energy to rats. How much energy will be available to hawks from snakes?

Plants → Rats → Snakes → Hawks [2]

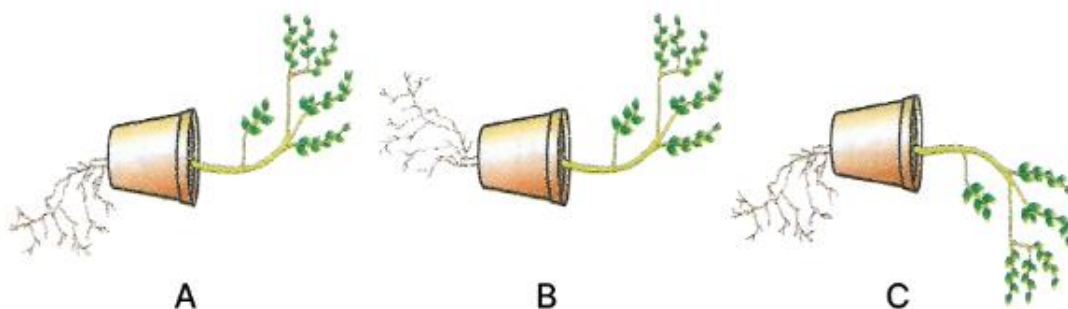
b) Bacteria and fungi are called decomposers. Why? [1]

Long Answer Questions:

34.a Patients whose gall bladder are removed are recommended to eat less oily food.

Why? [1]

b.



- Which one of these figures is correct? Give reason in support of your answer.
- Name the kind of movements shown by the root system and the shoot system. Define each.
- What are the two stimuli which affect root system and shoot system? Name them.
- Which of the following stimuli affect the growth of root strongly? [4]

35. Shristi heated Ethanol with a compound A in presence of a few drops of concentrated sulphuric acid and observed a sweet smelling compound B is formed. When B is treated with sodium hydroxide it gives back Ethanol and a compound C.

(A) Identify A and C.

(B) Give one use each of compounds A and B.

(C) Write the chemical reactions involved and name the reactions.

OR

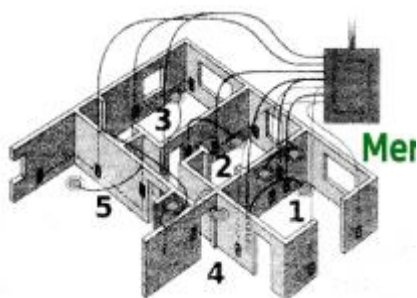
(A) What is the role of concentrated Sulphuric acid when it is heated with Ethanol at 443 K? Give the reaction involved.

(B) Reshu by mistake forgot to label the two test tubes containing Ethanol and Ethanoic acid. Suggest an experiment to identify the substances correctly? Illustrate the reactions with the help of chemical equations [5]

36. Draw the pattern of magnetic field lines around a current carrying solenoid and mark the North and South poles.

What can you say about the magnetic field inside the solenoid? How can a solenoid be used to form an electromagnet?

Or



The diagram above is a schematic diagram of a household circuit. The house shown in the above diagram has 5 usable spaces where electrical connections are made. For this house, the mains have a voltage of 220 V and the net current coming from the mains is 22A.

(A) What is the mode of connection to all the spaces in the house from the mains?

(B) The spaces 5 and 4 have the same resistance and spaces 3 and 2 have respective resistances of 20Ω and 30Ω . Space 1 has a resistance double that of space 5. What is the net resistance for space 5.

(C) What is the current in space 3?

(D) What should be placed between the main connection and the rest of the house's electrical appliances to save them from accidental high electric current?

Case Study Question

37. Pooja has green eyes while her parents and brother have black eyes. Pooja's husband Ravi has black eyes while his mother has green eyes and father has black eyes. (4)

(A) On the basis of the above given information, is the green eye colour a dominant or recessive trait? Justify your answer.

(B) What is the possible genetic makeup of Pooja's brother's eye colour?

(C) What is the probability that the offspring of Pooja and Ravi will have green eyes? Also, show the inheritance of eye colour in the offspring with the help of a suitable cross.

OR

(C) 50% of the offspring of Pooja's brother are green eyed. With help of cross show how this is possible.

38. Read the following and answer any four questions from (i) to (iv).

The spreading of light by the air molecules is called scattering of light. The light having least wavelength scatters more. The sun appears red at sunrise and sunset, appearance of blue sky it is due to the scattering of light. The colour of the scattered light depends on the size of particles. The smaller the molecules in the atmosphere scatter smaller wavelengths of light. The amount of scattering of light depends on the wavelength of light. When light from sun enters the earth's atmosphere, it gets scattered by the dust particles and air molecules present in the atmosphere. The path of sunlight entering in the dark room through a fine hole is seen because of scattering of the sun light by the dust particles present in its path inside the room.

- (i) To an astronaut in a spaceship, the colour of earth appears
(a) red
(b) blue
(c) white
(d) black
- (ii) At the time of sunrise and sunset, the light from sun has to travel.
(a) longest distance of atmosphere
(b) shortest distance of atmosphere
(c) both (a) and (b)
(d) can't say
- (iii) The colour of sky appears blue, it is due to the
(a) refraction of light through the atmosphere
(b) dispersion of light by air molecules
(c) scattering of light by air molecules
(d) all of these.
- (iv) The danger signs made red in colour, because
(a) the red light can be seen from farthest distance
(c) both (a) and (b)
(b) the scattering of red light is least
(d) none of these

39. To a solution of sodium hydroxide in a test tube, two drops of phenolphthalein are added.

- (i) State the colour change observed.
- (ii) If dil HCl is added dropwise to the solution, what will be the colour change?
- (iii) On adding few drops of NaOH solution to the above mixture the colour of the solution reappears. Why? [4]