Atul Tutorials Pvt. Ltd.

Kothrud |Aundh |Sangvi |Rt Bhusari|Pimle Saudagar

PRELIMS 1

Class 10 - Science

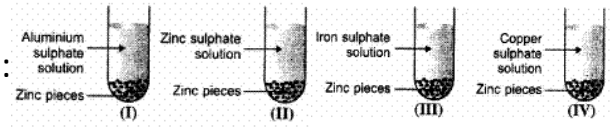
Time Allowed: 3 hours **Maximum Marks: 80**

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 be 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 be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answers 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

1. Zinc pieces were placed in each of the four test tubes containing different salt solutions as shown below **[1]**



A colour change would be observed in solutions:

a) II and IV b) III and IV

c) II and III d) I and IV

2. $CH_4 + Cl_2 \xrightarrow{\text{Sunlight}} CH_3Cl + HCl$ **[1]**

The above reaction is an example of

a) displacement reaction b) substitution reaction

c) addition reaction d) double displacement reaction

3. Select the correct option from the following: **[1]**

	Salt	Parent acid	Parent base	Nature of salt
(a)	Sodium acetate	CH_3COOH	NaOH	Neutral
(b)	Sodium carbonate	H_2CO_3	NaOH	Basic
(c)	Sodium chloride	HCl	NaOH	Acidic
(d)	Sodium nitrate	HNO_3	NaOH	Acidic

a) Option (b)

b) Option (a)

c) Option (c)

d) Option (d)

4. Select saponification reaction from the following: **[1]**

a) $C_4H_9OH \xrightarrow[KMnO_4]{\text{Alkaline}} C_3H_7COOH$

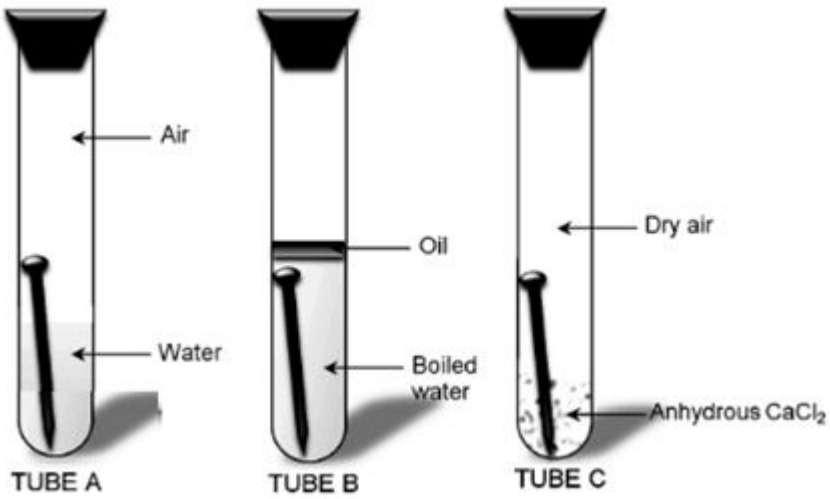
b) $CH_3COONa + NaOH \longrightarrow CH_4 + Na_2CO_3$

c) $CH_3COOC_2H_5 + NaOH \longrightarrow CH_3COONa + C_2H_5OH$

d) $2C_2H_5OH \longrightarrow 2C_2H_5COONa + H_2$

5. Take three boiling tubes A, B and C. Pour some water in test tube A Put iron nails in it and cork it. Pour boiled distilled water in another test tube B and put iron nails in it. Add 1 ml of oil over it such that oil floats over it and prevents the air from entering. Take some iron nails in test tube C and put some anhydrous calcium chloride in it and cork it. **[1]**

Leave all the three test tubes for one day and then observe.



In which test tube nail is rusted?

a) Tube B and C

b) Tube B

c) Tube A

d) Tube A and C

6. Which of the following is an alloy of copper and tin? **[1]**

a) Constantan
b) Brass
c) Nichrome
d) Bronze

7. In the soap micelles **[1]**

a) ionic end of soap is in the interior of the cluster and the carbon chain is out of the cluster.
b) both ionic end and carbon chain are in the interior of the cluster.
c) both ionic end and carbon chain are on the exterior of the cluster.
d) the ionic end of soap is on the surface of the cluster while the carbon chain is in the interior of the cluster.

8. A black strip of paper was clipped onto a destarched leaf in a potted plant to cover a part of the leaf. The plant was then exposed to sunlight for four hours, the paper strip was removed and the leaf was tested for starch. When iodine solution was added: **[1]**

a) The entire leaf turned blue-black.
b) The uncovered part of the leaf became blue-black.
c) The colour of the iodine solution remain unchanged.
d) The covered part of the leaf became blue-black.

9. A cross between two tall pea plants resulted in offsprings having a few dwarf plants. The gene-combination of the parental plants must be **[1]**

a) Tt and Tt
b) TT and Tt
c) TT and tt
d) Tt and tt

10. In Spirogyra, asexual reproduction takes place by **[1]**

a) division of a cell into many cells
b) division of a cell into two cells
c) formation of young cells from older cells
d) breaking up of filaments into smaller bits

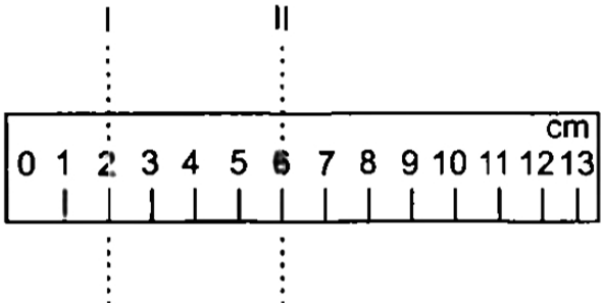
11. Alternative forms of a gene are called **[1]**

a) Chromosomes
b) Multiples
c) Loci
d) Alleles

12. An organism which breaks down the food material outside the body and then absorbs it is **[1]**

a) an animal parasite, Tapeworm
b) a fungi, Rhizopus
c) a bacteria, Rhizobium
d) a plant parasite, Cuscuta

13. Two long parallel conductors I and II placed at right angles to a metre scale, at the 2 cm and 6 cm marks, as shown. They carry currents of 1 A and 3 A respectively in same direction. They will produce zero magnetic field at the **[1]**



a) 6 cm mark
b) 3 cm mark
c) Zero mark
d) 10 cm mark

14. Two LED bulbs of 10W and 5W are connected in series. If the current flowing through 5W bulb is 0.005A, the current flowing through 10W bulb is: **[1]**

a) 0.0025A
b) 0.005A
c) 0.02A
d) 0.01A

15. Which of the following statements about food chain are correct? **[1]**

i. It includes repeated eating, i.e., each group eats the other and is subsequently eaten by some other group of organisms.
ii. It shows a series of branching lines and bidirectional flow of energy.
iii. It shows the unidirectional flow of energy and proceeds in a progressive straight line.
iv. Omnivores occupy different trophic positions in different food chains.

a) (i) and (iii) only
b) (i) and (ii) only
c) (i), (iii) and (iv) only
d) (ii) and (iv) only

16. A food chain will be more advantageous in terms of energy if it has **[1]**

a) 4 trophic levels
b) 5 trophic levels
c) 2 trophic levels
d) 3 trophic levels

17. **Assertion (A):** Copper spoon is used to stir silver nitrate solution. **[1]**
Reason (R): Copper is less reactive than silver.

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):** Pollen grains from the carpel stick to the stigma of the stamen. **[1]**
Reason (R): The fertilised egg cells grow inside the ovules and become seeds.

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):** The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the number of turns in it. **[1]**
Reason (R): The current in each circular turn has the same direction and the magnetic field due to each turn then just adds up.

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 (A):** Decomposers keep the environment clean. **[1]**
Reason (R): They recycle matter by breaking down the organic remains and waste products of plants and animals.

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.

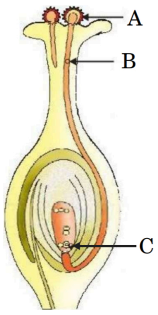
c) A is true but R is false.

d) A is false but R is true.

Section B

21. A carbon compound **P** on heating with excess of Cone. H_2SO_4 forms another carbon compound Q which on addition of hydrogen in the presence of nickel catalyst forms a saturated carbon compound **R**. One molecule of R on combustion forms two molecules of carbon dioxide and three molecules of water. Identify P, Q and R and write the chemical equations involved. **[2]**

22. Name the parts A, B and C of the diagram given below. Write a function of the part B. **[2]**



23. What are life processes? **[2]**

OR

How is oxygen and carbon dioxide transported in human beings?

24. Write the spherical mirror formula and explain the meaning of each symbol used in it. **[2]**

25. Distinguish between producers and consumers. **[2]**

OR

a. List two human-made ecosystems.

b. **We do not clean a pond in the same manner as we do in an aquarium.** Give reason to justify this statement.

26. A myopic person can see things clearly only when they lie between 10 cm and 100 cm from the eye. Which lens will enable him to see the Moon clearly? **[2]**

Section C

27. Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it. **[3]**

What will be the action of gas on

i. Dry litmus paper?

ii. Moist litmus paper?

Write a balanced chemical equation for the reaction taking place.

28. A lady bought a new iron container and kept blue vitriol solution into it. On the next day, she found that the blue colour of the solution fades. She went to the shopkeeper and complained. **[3]**

But the shopkeeper argued that the container is of good quality and he refused to return her money. An aware person Ankit came there and asked the matter. He told the lady that the container is of good quality and you have kept the wrong substance in it, so fault is all yours.

On the basis of given passage, answer the following questions.

i. What qualities are exhibited by Ankit?

ii. Why the container becomes porous when blue vitriol solution is kept into it?

OR

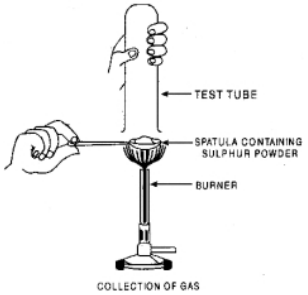
Pratyush took sulphur powder on a spatula and heated it. He collected the gas evolved by inverting a test tube over it, as shown in figure below.

a. What will be the action of gas on

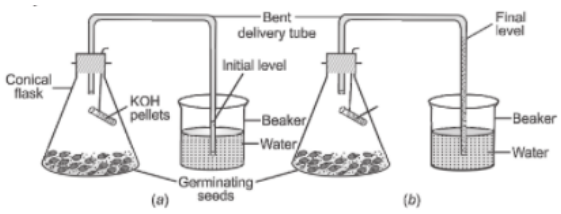
i. dry litmus paper?

ii. moist litmus paper?

b. Write a balanced chemical equation for the reaction taking place.



29. Study the fig (a) and (b). What difference you observe in the figure (b)? Give a justified reason for your answer. **[3]**



30. A red-eyed individual is crossed with a white-eyed individual to produce F_1 progeny with red eyes. When F_1 individuals are intercrossed, F_2 progeny is formed with both red as well as white-eyed individuals. **[3]**

a. How is the dominant trait identified?

b. What are recessive traits?

c. If 12 individuals are produced in F_2 generation, then how many white-eyed individuals would be obtained? Calculate the ratio of red-eyed individuals to white-eyed individuals.

31. Sudha finds out that the sharp image of window pane of her science laboratory is formed at a distance of 15 cm from the lens. She now tries to focus the building visible of her outside the window instead of the window pane without disturbing the lens. In which direction will she move the screen to obtain a sharp image of the building? What is the approximate focal length of this lens? **[3]**

32. Derive the relation between kilowatt hour and joule. **[3]**

33. Calculate the total cost of running the following electrical devices in the month of September, if the rate of 1 unit of electricity is Rs. 6.00. **[3]**

i. Electric heater of 1000 W for 5 hours daily.

ii. Electric refrigerator of 400 W for 10 hours daily.

Section D

34. i. Butane had both Carbon - Carbon bonds as well as Carbon Hydrogen bonds. Draw its structural formula and state the number of (1) C - H bonds and (2) C - C bonds in it. **[5]**

ii. You have two carbon compounds with the molecular formula C_3H_6O. Name two compounds with this formula and also draw their structural formula.

OR

i. It is observed that covalent compounds are bad conductors of electricity. Give reason.

ii. Carbon can neither form C^{4+} cation nor C^{4-} anion. Why?

iii. Draw electron dot structure of Ethanol.

iv. Identify hetero atom(s) in the following compounds:

a. $CH_3CH_2 - \underset{\underset{O}{\|}}{C} - CH_3$

b. CH_3CH_2Cl

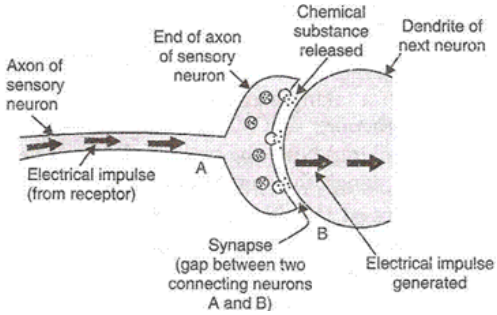
35. a. Suggest any two categories of contraceptive methods to control the size of human population which is essential for the prosperity of a country. Also explain about each method briefly. **[5]**

b. Name two bacterial and two viral infections each that can get sexually transmitted.

c. List two advantages of using condom during sexual act.

OR

Given below is a well-labelled diagram showing synapse between the two neurons.



Using the given diagram, answer the following questions:

i. What is the sequence in which nerve impulse travels?

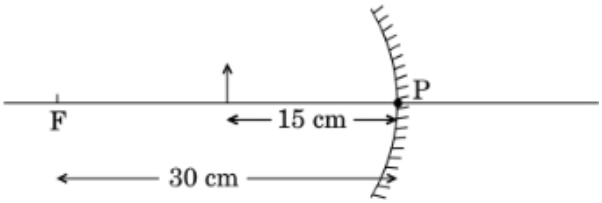
ii. How synapse between two neurons acts as a one-way valve?

iii. Which chemical substance is released when an electrical impulse coming from the receptor reaches the end of the axon of a sensory neuron?

iv. How a neurotransmitter starts an electrical impulse in the next neuron?

v. Which part of the neuron has a synaptic knob?

36. a. Complete the following ray diagram: **[5]**



b. Find the nature, position and size of the image formed.

c. Use mirror formula to determine the magnification in this case.

OR

Rishi went to a palmist to show his palm. The palmist used a special lens for this purpose.

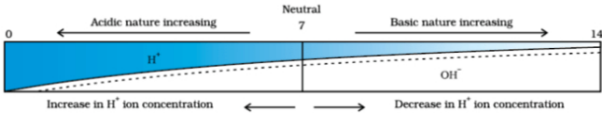
i. State the nature of the lens and the reason for its use.

ii. Where should the palmist place/hold the lens so as to have a real and magnified image of an object?

iii. If the focal length of this lens is 10 cm and the lens is held at a distance of 5 cm from the palm, use lens formula to find the position and size of the image.

Section E

37. A scale for measuring hydronium ion in a solution is called the pH scale. The pH of a neutral solution is 7. A value of less than 7 on the pH scale represents an acidic solution. As the pH value, increases from 7 to 14 it represents OH- ion concentration in solution i.e a basic solution. **[4]**



i. What is the pH range of the Human Body? (1)

ii. The strength of acid and bases depends on which factor? (1)

iii. If the pH of soil X is 7.5 while that of soil Y is 4.5, then which soil should be treated with powdered chalk to adjust its pH? (2)

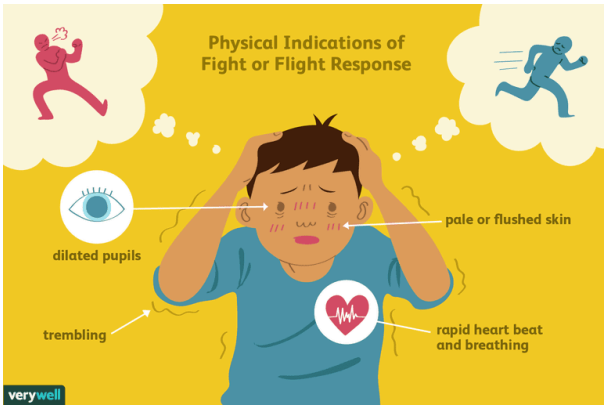
OR

Tooth decay starts when the pH of the mouth is lower than which pH? (2)

38. **Read the following text carefully and answer the questions that follow:** **[4]**

Adrenaline is secreted directly into the blood and carried to different parts of the body. The target organs or the specific tissues on which it acts include the heart. As a result, the heart beats faster, resulting in the supply of more oxygen to our muscles. The blood to the digestive system and skin is reduced due to contraction of muscles around small arteries in these organs. This diverts the blood to our skeletal muscles. The breathing rate also increases because of the contractions of the diaphragm and the rib muscles. All these responses together enable the animal body to be ready to deal with the situation. Such animal hormones are part of the endocrine system which constitutes the second way of control and

coordination in our body.



i. How does chemical coordination take place in animals? (1)

ii. Which hormone is called an emergency hormone? (1)

iii. Where are the adrenal gland present in our body? (2)

OR

How does our body respond when adrenaline is secreted into the blood? (2)

39. **Read the following text carefully and answer the questions that follow:** **[4]**

A student fixes a sheet of white paper on a drawing board using some adhesive materials. She places a bar magnet in the centre of it and sprinkles some iron filings uniformly around the bar magnet using a salt sprinkler. On tapping the board gently, she observes that the iron filings have arranged themselves in a particular pattern.

i. What does this pattern of iron filings demonstrate? (1)

ii. Draw a diagram to show this pattern of iron filings. (1)

iii. How is the direction of the magnetic field at a point determined using the field lines? Why do two magnetic field lines not cross each other? (2)

OR

How are the magnetic field lines of a bar magnet drawn using a small compass needle? Draw one magnetic field line each on both sides of the magnet. (2)