



PREBOARD (Set A)
Class X
SCIENCE

Max. Marks: 80

Time Allowed: 3 hours

General Instructions:

- (i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.
- (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.

SECTION A (Biology)**(One Mark Question till Q9)**

- Q1. Which of the following options indicates the products formed after breakdown of the glucose in our muscle cells when there is lack of oxygen?
- A. Ethanol + carbon dioxide + Energy
B. Lactic acid + Energy
C. Lactic acid + carbon monoxide + Energy
D. Carbon dioxide + Water + Energy
- Q2. The procedure used for cleaning the blood of a person by separating urea from it is called:
- A. osmosis B. filtration C. dialysis D. double circulation
- Q3. Which of the following is a correct combination of function and part of the brain?
- A. Posture and balance: Cerebrum B. Salivation: Medulla in midbrain
C. Hunger: Pons in hindbrain D. Blood pressure: Medulla in hindbrain
- Q4. The plant hormone whose concentration stimulates the cells to grow longer on the side of the shoot which is away from light is :
- A. Cytokinins B. Gibberellins C. Adrenaline D. Auxins
- Q5. In a cross between black furred rabbit (B) and white furred rabbit (b), all offspring were found to have black fur. What can be inferred about the genetic makeup of the parent rabbits?
- A. BB X bb B. Bb X Bb C. Bb X bb D. bb X bb
- Q6. Which are the correct statements related to ozone?
- (i) Ozone layer helps in increasing the UV radiations reaching earth.
(ii) Ozone is a deadly poison.
(iii) Ozone layer shields the earth from UV radiations.
(iv) Ozone layer prevents UV rays which cause skin cancer.
(v) Ozone is formed with the help of Chlorofluorocarbons.
- A. (i), (ii), (iii) B. (ii), (iii), (iv) C. (iii), (iv), (v) D. (i), (iv), (v)

Which of the following groups do not constitute a food chain ?

- (i) Wolf, rabbit, grass, lion
- (ii) Plankton, man, grasshopper, fish
- (iii) Hawk, grass, snake, grasshopper, frog
- (iv) Grass, snake, wolf, tiger

- A. (i) and (iv) B. (ii) and (iii) C. (i) and (iii) D. (ii) and (iv)

The following two questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

- A. Both A and R are true, and R is the correct explanation of A.
- B. Both A and R are true, and R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is false but R is true.

Q8. **Assertion:** A child which has inherited X chromosome from father will develop into a girl child.

Reason: Girl child inherits X chromosome from father and Y chromosome from mother

Q9. **Assertion:** Polythene bags and plastic containers are non-biodegradable substances.

Reason: They can be broken down by microorganisms in natural simple harmless substances.

Q10. (i) Write the balanced chemical equation for the process of photosynthesis,
(ii) When do the desert plants take up carbon dioxide and perform photosynthesis? (2)

Q11. Students to attempt either option A or B.

A. How many chambers are there in the heart of the following organisms? How is mixing of oxygenated and deoxygenated blood prevented in their body?

- (i) Fishes
- (ii) Humans

OR

B. Explain the mechanism by which the water is transported in plants? (2)

Q12. Will the impact of removing all the organisms in the trophic level be different for different trophic levels? Can the organisms of any trophic level be removed without causing any damage to the ecosystem? (2)

Q13. (a) Draw the structure of neuron and label cell body and axon.

(b) Name the part of neuron:

- (i) where information is acquired (3)
- (ii) through which information travels as an electrical impulse.

Q14. The gene type of green stemmed tomato plants are denoted as GG and that of purple stemmed tomato plants as ~~gg~~ ^{yy} when these two are crossed.

- (i) What colour of the stem would you expect in F1 progeny? *gyre*
- (ii) Give the percentage of purple stemmed plants if F2 is self-pollinated. *25%*
- (iii) In what ratio would you find the gene types GG and Gg in the F progeny? (3)

Q15. Neha consumed boiled sweet potatoes and boiled eggs for breakfast. Help her to understand some steps in the process of digestion of the food taken by her by answering the questions given below. Attempt either subpart A or B.

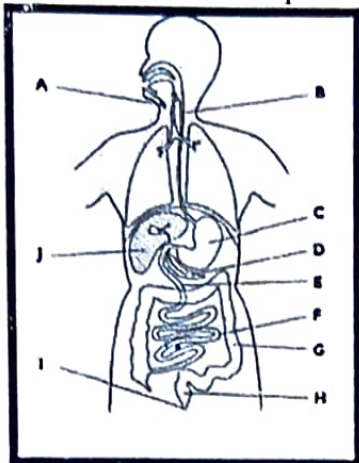
Which of these food items is rich in proteins? In which part of the alimentary canal is the digestion of this component initiated? Name the enzymes, conditions required and the glands associated with the digestion

OR

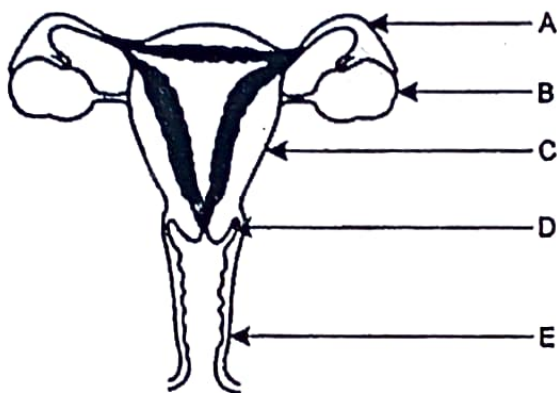
3. Which of these food items contains fats? How is it digested?

C. Which of these food items is rich in starch? How is its digestion initiated?

D. The figure given below represents parts of the human alimentary canal. Which of these parts will have the maximum amount of digested food as soon as the process of digestion is completed? (4)



Q16. (a) Name the parts labelled A, B, C, D and E.



(b) Where do the following functions occur?

- (i) Production of an egg
- (ii) Fertilisation
- (iii) Implantation of zygote.

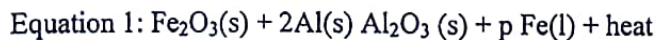
(c) What happens to the lining of uterus:

- (i) before release of a fertilised egg?
- (ii) if no fertilisation occurs?

(5)

SECTION B

Q17. Which of the following equations represent redox reactions and what are the values for 'p' and 'q' in these equations?



A. Only equation 1 is a redox reaction, $p=1$ and $q=3$

- B. Both equations 1 and 2 are redox reactions, $p=2$ and $q=4$
C. Only equation 2 is a redox reaction, $p=2$ and $q=10$
D. Both equations 1 and 2 are redox reactions, $p=2$ and $q=10$ (1)

18. Which of the following is neutral salt?

- A. NH_4Cl B. $\text{CH}_3\text{COONH}_4$ C. CH_3COONa D. Na_2CO_3 (1)

19. An iron nail is added to each of the two test tubes 'P' and 'Q' containing aqueous copper (II) sulphate, and aqueous silver nitrate respectively. Which of the following observation is correct?

- A. In test tube 'P' iron nail is coated with a blue coating and in test tube 'Q' there is no reaction.
B. Iron nail is coated with a brown coating in test tube 'P' and silver coating in test tube 'Q'.
C. There is no reaction in either of the test tubes 'P' or 'Q'.
D. There is no reaction in test tube 'P' but a silver coating on iron nail is seen in test tube 'Q'. (1)

20. An aqueous solution turns the red litmus solution blue. Excess addition of which of the following solutions would reverse the change?

- A. Baking powder B. Lime C. Ammonium hydroxide D. Hydrochloric acid (1)

21. Which of the following substances when dissolved in equal volume of water, will have the highest pH value?

- A. Sulphuric acid B. Acetic acid C. Magnesium hydroxide D. Sodium hydroxide (1)

22. When excess carbon dioxide is passed through lime water, the milkiness disappears because

- A. water soluble calcium carbonate converts to water soluble calcium bicarbonate.
B. insoluble calcium carbonate converts to water soluble calcium bicarbonate.
C. water soluble calcium carbonate converts to insoluble calcium bicarbonate.
D. insoluble calcium carbonate converts to insoluble calcium bicarbonate. (1)

23. In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?

- A. Lead sulphate (insoluble) B. Lead acetate C. Ammonium nitrate D. Potassium sulphate (1)

The following two questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

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B. Both A and R are true, and R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

Q24. Assertion(A) : If the first member of a homologous series is methanal, its third member will be propanal.

Reason (R) : All the members of a homologous series show similar chemical properties. (1)

Q25. You are given a hammer, a battery, a bulb, wires and a switch.

(a) How could you use them to distinguish between samples of metals and non-metals?

Assess the usefulness of these tests in distinguishing between metals and non-metals. (2)

6. Attempt either option A or B.

A. An element 'X' is stored in kerosene, and cannot be extracted from its ore using a reducing agent. 'X' forms an ionic compound on reaction with chlorine.

(i) Can we store 'X' in water? Give reason to support your answer.

(ii) Identify element 'X'. Name the process used and write the equation for extraction of 'X' from its ore.

OR

B. The domes of many building in Europe are made of copper. These domes now appear greenish in colour.

(i) Why do the domes appear greenish though copper is orange-red in colour?

(ii) In your opinion, should the copper domes be replaced by iron domes to overcome the problem of change of colour of copper domes?

(iii) Domes used to be made from thin sheets of metals. Why did the ancient architects use copper to make domes? (3)

Q27. Identify the type of reaction:



(3)

Q28. There are so many important compounds known, which have some characteristic properties like Bleaching powder used as an disinfectant, POP used for joining fractured bones, Baking powder used for making dhoklas and baking cake, Sodium chloride as a table salt etc. These properties make these compounds very useful in our daily routine.

(i) The ratio of the water molecule in plaster of Paris and gypsum is

a) 3:1

b) 1:3

~~c) 1:4~~

d) 4:3

(ii) Baking powder is

a) sodium carbonate + sodium tartaric

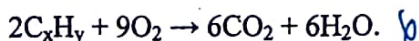
b) sodium bicarbonate + sodium tartaric

c) sodium carbonate + tartaric acid

d) sodium carbonate + sodium benzoate

(iii) What happens when POP combines with water? Write the chemical reaction involved? (4)

Q29. A. A hydrocarbon with the formula C_xH_y undergoes complete combustion as shown in the following equation:



(a) What are the values of 'x' and 'y'?

(b) Give the chemical (IUPAC) name of the hydrocarbon.

(c) Is C_xH_y a saturated or an unsaturated hydrocarbon?

(d) Name the alcohol which on heating with conc. H_2SO_4 will produce the above hydrocarbon C_xH_y .

(e) Write a balanced chemical equation for the reaction of C_xH_y with hydrogen gas in presence of Nickel.

OR

B. Oxygen can combine with both metals and non-metals. It combines with Calcium to form CaO and with carbon to form CO_2 .

- (a) What type of bond is formed between carbon and oxygen?
 (b) Identify the type of bond formed between Calcium and oxygen.
 (c) Which of the above compounds will be a good conductor of electricity in molten state and why?
 (d) Comment on the physical state (solid, liquid or gas) of CaO and CO₂.
 (e) What is the valency of carbon in CO₂? (5)

SECTION C

One Mark Questions

Q30. Mirror 'X' is used to concentrate sunlight in solar furnace and Mirror 'Y' is fitted on the side of the vehicle to see the traffic behind the driver. Which of the following statements are true for two mirrors?

- (i) The image formed by mirror 'X' is real, diminished and at its focus.
 (ii) The image formed by mirror 'Y' is virtual, diminished and erect.
 (iii) The image formed by mirror 'X' is virtual, diminished and erect.
 (iv) The image formed by mirror 'Y' is real, diminished and at its focus.
 (a) (i) and (ii) (b) (ii) and (iii)
 (c) (iii) and (iv) (d) (i) and (iv)

Q31. When a narrow beam of white light passes through a glass prism it splits into its component colours ?

This phenomenon is called :

- A. Diffusion of light B. Total reflection of light
 C. Scattering of light D. Dispersion of light

Q32. Assertion (A) : When ciliary muscles contract, eye lens becomes thin.

Reason (R) : Ciliary muscles control the power of the eye lens.

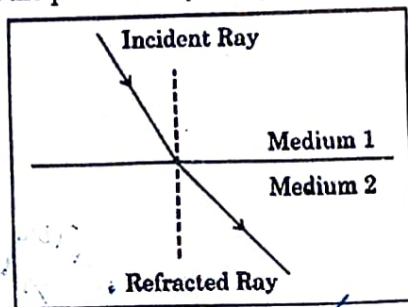
- a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
 b) Both Assertion (A) and Reason (R) are true, but Reason is not the correct explanation of Assertion (A).
 c) Assertion (A) is true, but Reason (R) is false.
 d) Assertion (A) is false, but Reason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

Q33. A. Calculate the resistance of an aluminium wire of length 1 m and area of cross-section 2 mm².
 Resistivity of aluminium is $2.63 \times 10^{-8} \Omega \text{ m}$.

OR

B. What is the function of the earth wire ? State the advantage of the earth wire in domestic electric appliances such as electric iron. (2)

Q34. Study the figure in which the path of a ray of light going from Medium 1 to Medium 2 is shown.



- (a) Out of the two Media - Medium 1 and Medium 2, in which is the speed of light more?
 (b) Express refractive index of Medium 2 with respect to Medium 1 in terms of speed of light in two media. (2)

Q35. Identify the defect of vision in each of the following cases and suggest its corrective measure:

- (a) The eye lens has become milky and cloudy.
 (b) The eye lens has excessive curvature.
 (c) The eye lens has large focal length (longer than normal)

(3)

