

JB ACADEMY, AYODHYA
HALFYEARLY EXAMINATION(2025-26)
Class – X, Subject : Science (086)

Time Allowed: 3 hours

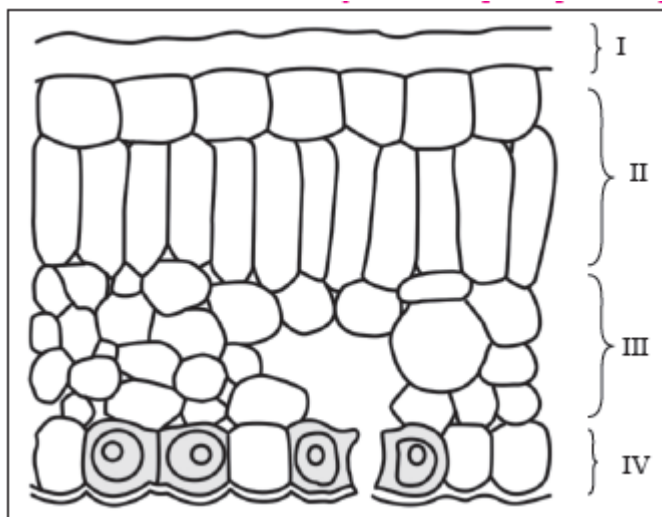
Max. Marks: 80

General Instructions:

- (i) This question paper consists of 38 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)

- Q1. Large intestine in man mainly carries out 1
(a) absorption of H_2O (b) assimilation (c) digestion of fats (d) digestion of carbohydrates
- Q2. Normal blood pressure (systolic/diastolic) is 1
(a) 120/80 mm of Hg (b) 160/80 mm of Hg (c) 120/60 mm of Hg (d) 180/80 mm of Hg
- Q3. In the given transverse section of the leaf identify the layer of cells where maximum photosynthesis occurs. 1



- (a) I, II (b) II, III (c) III, IV (d) I, IV
- Q4. An incomplete equation for the digestion of starch using saliva is shown as: Saliva + Starch (in test tube) What will be the likely outcome of this? 1
(a) Saliva will convert starch into complex fat molecules.
(b) Saliva will convert starch into complex sugar molecules.
(c) Saliva will breakdown starch into simple sugar molecules.
(d) Saliva will breakdown starch into simple protein molecules.
- Q5. Read the following statements. 1
X: Amount of carbon dioxide produced per molecule of glucose during aerobic respiration.
Y: Amount of carbon dioxide produced per molecule of glucose during fermentation by yeast.
Which of the following is TRUE about X and Y?
(a) X is more than Y. (b) X is less than Y.
(c) X is equal to Y. (d) Cannot be determined.

Q6. Which option correctly shows the order of events when a bright light is focused on our eyes? 1

- (a) Bright light → receptors in eyes → sensory neuron → spinal cord → motor neurons → eyelid closes
- (b) Bright light → receptors in eyes → spinal cord → sensory neuron → motor neurons → eyelid closes
- (c) Bright light → receptors in eyes → sensory neuron → motor neurons → spinal cord → eyelid closes
- (d) Bright light → receptors in eyes → spinal cord → motor neurons → sensory neuron → eyelid closes

Q7. Electrical impulse travels in a neuron from 1

- (a) Dendrite --- axon ----- axon end ---- cell body.
- (b) Cell body--- dendrite--- axon--- axonal end.
- (c) Dendrite--- cell body--- axon--- axonal end.
- (d) Axon terminal end--- axon--- cell body—dendrite.

In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

- (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).
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- (d) Assertion (A) is false but reason (R) is true

Q8. Assertion: When air is passed through lime water, lime water turns milky. 1

Reason: Air contains 78% nitrogen and 21% oxygen

Q9. Assertion: The build up of lactic acid in our muscles during sudden activity causes cramps. 1

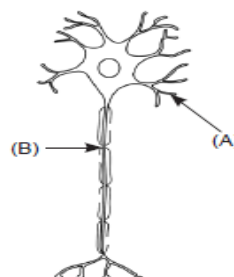
Reason: The anaerobic respiration in animal muscle tissue produces lactic acid as the end produce.

Q10. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds? 2

Q11. Why is transpiration important for plants? 2

OR

- (a) Name the parts labelled A and B in the neuron drawn above.
- (b) Which part acquires the information in the neuron?
- (c) Through which part does the information travel?
- (d) In what form does this information travel?



Q12. Draw the excretory system in human beings and label the organs of excretory system which perform the following functions: 2

- a) forms urine
- b) is a long tube which collects urine from kidney.
- c) stores urine until it is passed out .
- d) Why do arteries have thick and elastic walls whereas veins have valves?

Q13. Explain the process of breakdown of glucose in a cell 3

- (a) in the presence of oxygen, (b) in the absence of oxygen.

Q14. What is 'reflex action'? Draw the reflex arc to show passage of reflex action. 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. 4

Attempt either subpart A or B.

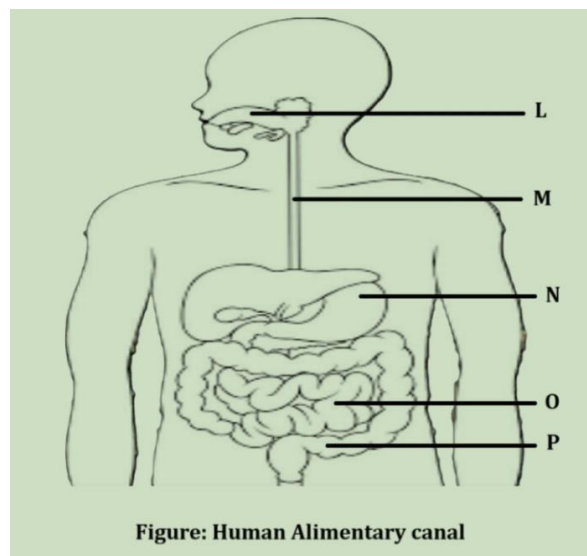
A. Which of these food items is rich in proteins? In which part of the alimentary canal is the digestion of this component initiated? Name the enzymes, conditions required and the glands associated with the digestion here.

OR

B. 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?



Q16. The heart is a pumping organ that receives blood from the veins and pumps it into the arteries. It is situated in the thoracic cavity which lies above the diaphragm between the two lungs. It is enclosed in a double walled membranous sac. 5

- (a) Name the double walled membranous sac that encloses the heart.
(b) Write the name and function of valves present in between atria and ventricles.
(c) The left ventricle of the heart has a thicker wall than the right ventricle. Explain.
(d) Mention components of blood.
(e) What is the advantage of separate channels in mammals and birds for oxygenated and deoxygenated blood?

OR

Plants lose water in vapour form from the aerial parts by the process of transpiration. Besides removal of excess water, transpiration also helps in upward movement of cell sap, to regulate temperature of the plant and helps to absorb and distribute the salt.

- (a) What is ascent of sap?
(b) Explain the mechanism of opening and closing of stomata.
(c) With the help of neat labelled diagram explain translocation of food in plants.

SECTION - B (CHEMISTRY)

Q17. The compound having maximum no. of water of crystallisation in its crystalline form in one formula unit is

- a) FeSO_4 b) CuSO_4 c) CaSO_4 d) Na_2CO_3 1

Q 18. Which of the following gives the correct increasing order of acidic strength 1

- a) Water < Acetic acid < Hydrochloric acid b) Acetic acid < Hydrochloric acid < Water
c) Water < Hydrochloric acid < Acetic acid d) Hydrochloric acid < Water < Acetic acid

Q 19. Which of the following will not give Carbon dioxide gas on treatment with dil. Acids 1

- a) Marble b) Limestone c) Lime d) Baking soda

Q20. With the increase in the concentration of hydrogen ions the pH value will 1

- a) Increase b) decrease c) Remain constant d) Remain fluctuating

Q 21. $w \text{ SnO}_2 + x \text{ H}_2 \rightarrow y \text{ Sn} + z \text{ H}_2\text{O}$ 1

For which of the following values of w, x, y and z will the equation above be balanced

- a) $w=1, x=1, y=1, z=1$ b) $w=1, x=2, y=2, z=1$
c) $w=1, x=2, y=1, z=2$ d) $w=1, x=1, y=1, z=2$

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Q 22. Assertion – During double displacement reactions, precipitates are usually formed 1

Reason - Precipitation reactions produce insoluble salts.

Q 23. In the reaction of zinc granules with dil. Sulphuric acid, what would happen if following changes are made – 2

- (i) In place of Zinc granules, same amount of zinc powder will be taken.
(ii) Instead of dil. sulphuric acid, dil. Hydrochloric acid is taken.
(iii) In place of zinc, copper turnings are taken
(iv) In place of sulphuric acid, Sodium hydroxide is taken in the test tube.

Q 24. Mention the colour changes observed (with chemical equation) when – 2

- (i) A piece of zinc is dropped in copper sulphate solution.
(ii) Copper powder is strongly heated in the presence of oxygen.

Q 25. Explain three main types of Decomposition reactions with suitable examples. 3

Q26. The pH of a salt used to make tasty crispy pakoras is 9. Identify the salt and write its common name, chemical name and chemical formula. How is this salt prepared? Also list its one use. 3

Q 27. Give suitable reasons for the following – 5

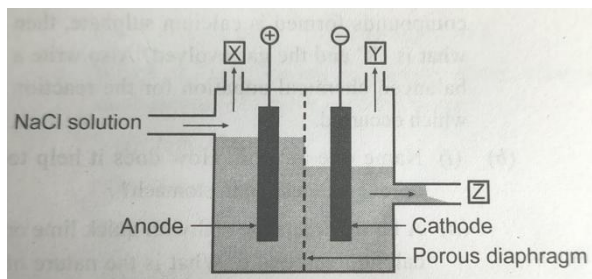
- (i) An aqueous solution of sodium chloride is neutral, but aqueous solution of sodium is basic in nature.
(ii) Plaster of Paris is stored in a moisture proof container
(iii) Acid should be added to water while diluting.
(iv) Butter is stored in refrigerator.
(v) Colour of copper sulphate crystal changes on heating.

OR

27. Compounds such as Alcohol and Glucose also contain hydrogen, but are not categorized as acids. With the help of an activity prove this.

Q28. In the diagram given below when electricity is passed through an aqueous solution of common salt, a substance 'Z' is produced along with the evolution of gases 'X' and 'Y'. When a burning matchstick is brought near the gas 'Y' it burns with a pop sound, whereas 'X' is used for disinfecting drinking water. When gas 'X' is passed through a solution of slaked lime, an insoluble substance 'A' is produced

4



(i) What are gases 'X' and 'Y' ?

(ii) Write balanced chemical equation for the formation of substance 'A'

(iii) Write your observation if a drop of phenolphthalein and blue litmus solution are one by one added to aq. solution of substance 'Z'

(iv) Write a balanced chemical equation that takes place when 'X' and 'Y' react together.

SECTION - C (PHYSICS)

29. A beam of white light falls on a glass prism. The colour of Light which undergoes the least bending on passing through the glass prism is:

1

- a. violet b. red c. green d. blue

30. A small bulb is placed at the focal point of a converging lens. When the bulb is switched on, the lens produces:

1

- a. a convergent beam of light b. a divergent beam of light
c. a parallel beam of light d. a patch of coloured light

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31. Assertion (A): A rainbow is seen in the sky only when the sun is behind the observer.

Reason (R): A rainbow is produced in the sky due to the dispersion of sunlight by the tiny drop of water hanging in the atmosphere after the rainfall.

1

32. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil appear to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine. Support your answer with reason. 2

33. (A) A person needs a lens of power -4.5 D for correction of her vision. 2

(a) What kind of defect in vision is she suffering from?

(b) What is the focal length of the corrective lens?

(c) What is the nature of the corrective lens?

OR

33. (B) Draw a ray diagram showing the dispersion through a prism when a narrow beam of white light is incident on one of its refracting surfaces. Also indicate the order of the colours of the spectrum obtained.

34. Explain the structure and functioning of Human eye. How are we able to see nearby as well as distant objects? 3

35. Write laws of refraction. Explain the same with the help of ray diagram, when a ray of light passes through a rectangular glass slab. 3

36. The image of a candle flame formed by a lens is obtained on a screen placed on the other side of the lens. If the image is three times the size of the flame and the distance between lens and image is 80 cm, at what distance should the candle be placed from the lens? What is the nature of the image at a distance of 80 cm and the lens? 3

37. The spherical mirror forms different types of images when the object is placed at different locations. When the image is formed on screen, the image is real and when the image does not form on screen, the image is virtual. When the two reflected rays meet actually, the image is real and when they appear to meet, the image is virtual. A concave mirror always forms a real and inverted image for different positions of the object. But if the object is placed between the focus and pole. The image formed is virtual and erect. A convex mirror always forms a virtual, erect and diminished image. A concave mirror is used as doctor's head mirror to focus light on body parts like eyes, ears, nose etc., to be examined because it can form erect and magnified image of the object. The convex mirror is used as a rear view mirrors in automobiles because it can form an small and erect image of an object.

(i) When an object is placed at the centre of curvature of a concave mirror, the image formed is

- (a) larger than the object (b) smaller than the object
- (c) same size as that of the object (d) highly enlarged.

(ii) No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be

- (a) plane (b) concave (c) convex (d) either plane or convex.

(iii) A child is standing in front of a magic mirror. She finds the image of her head bigger, the middle portion of her body of the same size and that of the legs smaller. The following is the order of combinations for the magic mirror from the top.

- (a) Plane, convex and concave (b) Convex, concave and plane
- (c) Concave, plane and convex (d) Convex, plane and concave

(iv) To get an image larger than the object, one can use

- (a) convex mirror but not a concave mirror (b) a concave mirror but not a convex mirror
(c) either a convex mirror or a concave mirror (d) a plane mirror.

38. (A) An object 5 cm high is placed at a distance of 10 cm from a convex mirror of radius of curvature 30 cm. Find the nature, position and size of the image. Also draw a ray diagram for the given situation.

(B) Write all four rules to obtain image by concave mirror.

3+2=5