CARMEL CONVENT SCHOOL, CHANDIGARH
PERIODIC TEST II SESSION 2024-25
SCIENCE

Class: X
Date: 21.09.24

Total marks: 80
Time: 3 hr

BIOLOGY (27)

General Instructions

i. This question paper consists of 15 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 5 objective type questions carrying 1 mark each.
iv. Section B consists of 2 Very Short questions carrying 02 marks each.
v. Section C consists of 3 Short Answer type questions carrying 03 marks each.
vi. Section D consists of 1 Long Answer type questions carrying 05 marks each.
vii. Section E consists of source-based/case-based units of assessment of 04 marks.

Section A

MCQs

1. A part of the body which responds to the instructions sent from nervous system is called
   a. Receptor
   b. Effector
   c. Nerves
   d. muscles
2. Which plant hormone inhibits growth?
   a. Auxin
   b. Gibberellin
   c. Cytokinins
   d. Abscisic acid
3. Which part of nephron allows the selective reabsorption of useful substances like glucose, amino acids, salts and water into the blood capillaries?
   a. Tubule
   b. Glomerulus
   c. Bowman's capsule
   d. Ureter
4. Carrying digested and absorbed fat from intestine to the blood is the function of
   a. Villi
   b. Intestinal enzymes
   c. Lymph
   d. Liver

5. **ASSERTION AND REASONING**

DIRECTIONS : 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).
c) Assertion (A) is true but reason (R) is false.
d) Both Assertion and reasoning are false.

Assertion: Fish have a two chambered heart
Reason : Fish have a fast breathing rate

Section B

6. a. Write a complete and balanced equation of photosynthesis.
   b. Where does the oxygen molecule produced during photosynthesis come from?
7. How are the alveoli designed to increase the efficiency of respiration?

Section C

8. Show with the help of a flow diagram the various pathways of breakdown of glucose.
9. Draw a neat diagram of the Nephron and label the parts
   a. where filtration takes place
   b. where reabsorption takes place &
   c. secretion takes place.

Or

Draw a neat and well labelled diagram of the human brain.

10.
   a. Differentiate between the movement in Touch-me-not plant and bending of the shoot towards sunlight.
   b. What causes the tendrils of the pea plant to coil around the support?

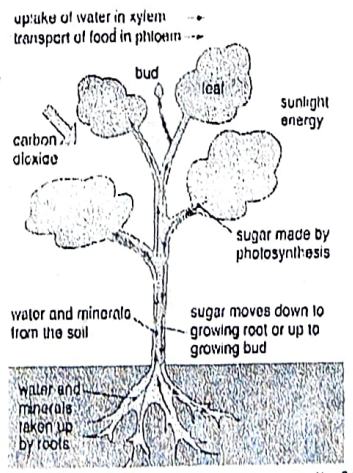
Section D

11. Give a term for the following:
   a. The fluid filtered through the capillaries present in the Bowman's Capsule into the renal tubule
   b. A common opening for both air and food in humans
   c. The mechanism in a living organism, to maintain the levels of hormones in the body in the desired limits by triggering increase or decrease of the levels of the hormone
   d. Transfer of electric chemical signals along the neurons.
   e. Energy currency in the cell.

Section E: Case Study based Question

Transport systems

- There are two transport systems in a plant.
- One that transports water and minerals from root to all other parts. These vessels are called .....
- Another vessels transport sugars (sucrose) and amino acids made in leaves to all other plant parts. These are called phloem vessels.



12. Transport of food materials in higher plants occurs through
    a. Leaves
    b. Companion cells
    c. Tracheids
    d. Sieve elements

13. The movement of materials from the leaves to other tissues of the plant is called
    a. Tropic movement
    b. Ascent of sap
    c. Transpiration
    d. Translocation

14. Water will be absorbed by root hair when
    a. Concentration of solutes in cell sap is high
    b. Plant is rapidly respiring
    c. They are separated from soil by a semipermeable membrane
    d. Concentration of solutes in soil is high

15. Food is transported from leave to different parts of plant body as
    a. Glucose ions
    b. Sucrose ions
    c. Sodium ions
    d. Potassium ions

CHEMISTRY (MM:26)

GENERAL INSTRUCTIONS:

a. **Q 1-7 are MCQ's carrying 1 mark each.**
b. **Q 8-9 are short answers carrying 2 marks each.**
c. **Q 10-11 are short answers carrying 3 marks each.**
d. **Q 12 is a case-based question and carry 4 marks.**
e. **Q 13 carry 5 marks.**
f. **All questions are compulsory.**

1. During the preparation of hydrogen chloride gas on a humid day the gas is usually passed through a guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to
    a. absorb the evolved gas.
    b. moistens the gas.
    c. absorb moisture from the gas.
    d. absorbs Cl ions from the evolved gas.

2. Electrolysis of water is a decomposition reaction the mole ratio of hydrogen and Oxygen gas liberated during electrolysis of water is
    a. 1:1
    b. 2:1
    c. 4:1
    d. 1:2

3. Which acid is present in ant's sting?
    a. Citric Acid
    b. Oxalic Acid
    c. Methanoic Acid
    d. HCl

4. Which of the following salts does not contain water of crystallization?
    a. Blue vitriol
    b. Baking soda
    c. Washing soda
    d. Gypsum

5. Which of the following is the property of ionic compounds?
    a. They have high melting and boiling points.
    b. They conduct electricity in solution or in a molten state.
    c. Both (a) and (b)
    d. None of the above.

6 If nucleon (mass) and proton (atomic) number is 40 and 20 respectively, the element is

a. Chlorine
b. Phosphorus
c. Potassium
d. Calcium

7. Silver articles become black on prolonged exposure to air. This is due to formation of

a. Silver Iodide
b. Silver Nitrate
c. Silver sulphide
d. Silver oxide

8. What is Thermit reaction? Write its chemical equation. What is it used for?

9. Define an Ionic bond. Using dot structure show the formation of $MgCl_2$.

10. What are amphoteric oxides? Give an example and chemical equation to support your answer.

11. Compound such as alcohols and glucose also contain hydrogen but are not categorized as acids describe an activity to prove it using the diagram.

12. Metals are extracted in pure form from their ores on the basis of their chemical properties. Metals of high reactivity and extracted from the ores by electrolysis of their molten ores. Metals of lower reactivity are extracted from the sulphide ores which are converted into their oxides. The oxides of these metals are reduced to metals by simple heating. Metal X is found in nature as its sulphide XS. it is used in the galvanisation of iron articles.

(a). Identify the metal X. 1

(b). How will you convert this sulphide ore into the metal? Explain with equations. 3

13.Name the following:

a. Metal that can be cut by knife
b. Lustrous non-metal
c. Metal that exists in liquid state at room temperature
d. Most malleable and ductile metal
e. Metal that is best conductor of electricity

PHYSICS (MM:27)

MCQ **(1x9=9)**

1. Which of the following can make a parallel beam of light when light from a point source is incident on it?

a) Concave mirror as well as convex lens.
b) Convex mirror as well as concave lens.
c) Two plane mirrors placed at 90° to each other's.
d) Concave mirror as well as concave lens.

2. Consider these indices of refraction: glass: 1.52; air: 1.0003; water: 1.333. Based on the refractive indices of three materials, arrange the speed of light through them in decreasing order.

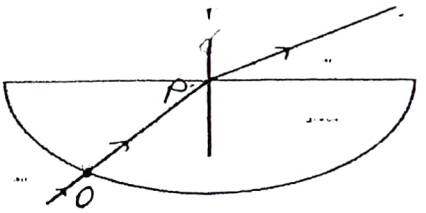
a) The speed of light in water > the speed of light in air > the speed of light in glass.
b) The speed of light in glass > the speed of light in water > the speed of light in air.
c) The speed of light in air > the speed of light in water > the speed of light in glass.
d) The speed of light in glass > the speed of light in air > the speed of light in water.

3. The refractive index of flint glass is 1.65 and that for alcohol is 1.36 with respect to air. What is the refractive index of the flint glass with respect to alcohol?

A. 0.82 B. 1.21 C. 1.11 D. 1.01

4. Which of the following statements is not true for scattering of light?
(a) Color of the scattered light depends on the size of particles of the atmosphere.
(b) Red light is least scattered in the atmosphere.
(c) Scattering of light takes place as various colors of white light travel with different speed in air.
(d) The fine particles in the atmospheric air scatter the blue light more strongly than red. So, the scattered blue light enters our eyes.

5.



The angle of incidence from air to glass at the point O on the hemispherical glass slab is.
A. 45°
B. 0°
C. 90°
D. 180°

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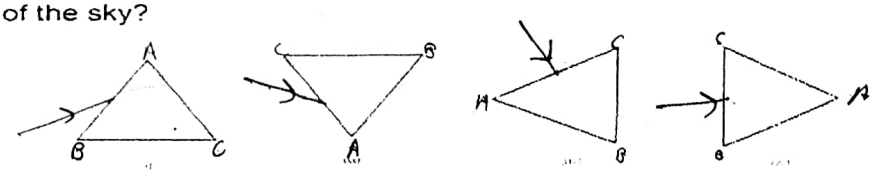
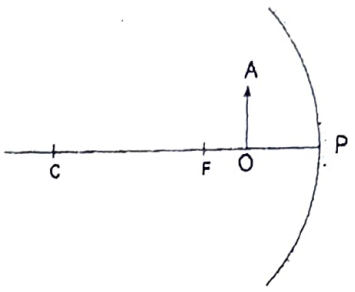
6. A prism ABC (with BC as base) is placed in different orientations. A narrow beam of white light is incident on the prism as shown in below Figure. In which of the following diagrams, after dispersion, the third colour from the top of the spectrum corresponds to the colour of the sky?



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

7.

For the diagram shown, according to the new Cartesian sign convention the magnification of the image formed will have the following specifications:



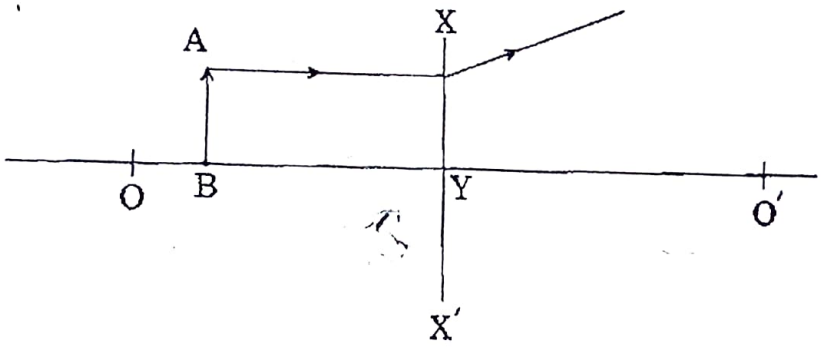
(a) Sign – Positive, Value – Less than 1

(b) Sign – Positive, Value – More than 1

(c) Sign – Negative, Value – Less than 1

(d) Sign – Negative, Value – More than 1

8. Study the diagram given below and identify the type of the lens XX' and the position of the point on the principal axis 00' where the image of the object AB appears to be formed:



a) Concave; between O' and Y

b) Concave; between O and Y

c) Convex; between O' and Y

c) Convex; between O and Y

9. The image of an object placed in front of a concave mirror of focal length 15 cm is of the same size as the object. The distance between the object and its image is

(a)15 cm (b)30 cm (c)60 cm (d)Zero

For Question numbers 10-13, two statements are given - one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

(A) Both A and R are true and R is 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.

(1x4=4)

10. Assertion: The bottom of the tank or pond filled with water appears to be raised
Reason : The apparent depth of the tank is given by 1/n times the original depth.

11. Assertion :The value of f in a concave is taken as –ve and then convex it is taken as +ve
Reason : All distances measured to the right of the origin are taken as positive and those measured along the left of the origin are taken as negative .

12. Assertion. Myopia is the defect of vision in which a person cannot see the distant objects clearly
Reason. This is due to eyeball being too short

13. Assertion: When a white light beam passes through a glass prism Spectrum is obtained.
Reason: The different colours have the same speed while passing through the glass prism.

14. A real image, 4/5th the size of the object is formed 18 cm from a lens. Calculate the focal length of the lens. (2)

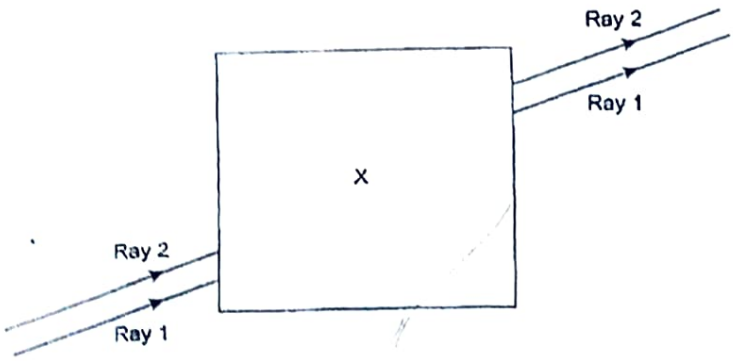
15. When and where do we see a rainbow? Draw a labelled diagram to illustrate. (2)

16. (a) What is meant by the power of accommodation of an eye? (3)
(b) A person with a myopic eye cannot see objects beyond 1.2 m directly. What should be the type of the corrective lens used? What would be its power?

CASE STUDY [4]

Case

Noor, a young student, was trying to demonstrat some properties of light in her Science project work. She kept 'X' inside the box (as shown in the figure) and with the help of a laser pointer made light rays pass through the holes on one side of the box. She had a small butter-paper screen to see the spots of light being cast as they emerged.



17. What could be the 'X' that she placed inside the box to make the rays behave as shown?
(a) a converging lens (b) a parallel-sided glass block
(c) a plane mirror (d) a triangular prism

18. She measured the angles of incidence for both the rays on the left side of the box to be 48.6°. She knew the refractive index of the material X' inside the box was 1.5. What will be the approximate value of angle of refraction? (use the value: sin 48.6° = 0.75)
(a) 45° (b) 30° (c) 40° (d) 60°

12. Assertion: Myopia is the defect of vision in which a person cannot see the distant objects clearly
Reason: This is due to eyeball being too short

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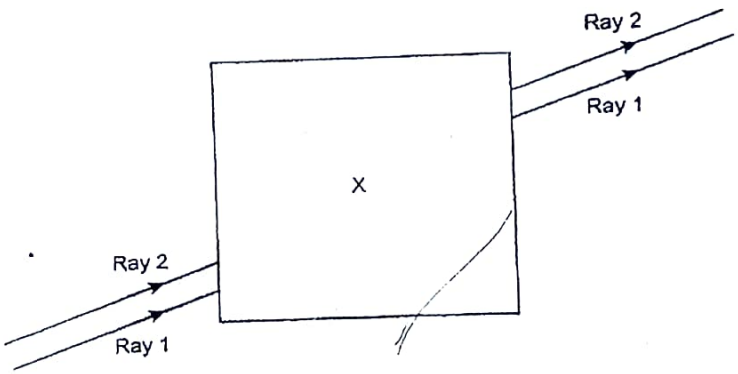

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