ST. JOHN'S HIGH SCHOOL
SECTOR 26, CHANDIGARH
Class 10 Science
Pre-Board 1 (2025-26)

Duration: 3hrs M.M. 80

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.

SECTION A (Biology) 27 marks

1. Which one of the following has half the number of chromosomes and half the amount of DNA as compared to the non-reproductive body cells? (1)

A. male germ cell B. female germ cell
C. zygote D. both A and B are correct

2. What is the phenotypic ratio of a dihybrid cross in F2 generation? (1)

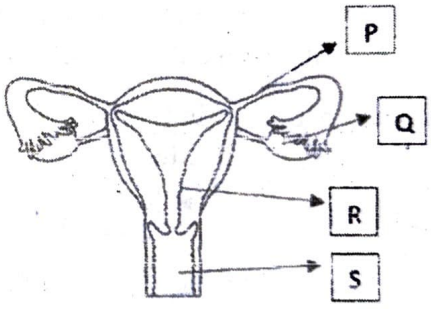
A. 9:3:3:1 B. 9:3:1:1
C. 9:1:1:3 D. 6:3:3:1

3. Syphilis, Warts, Gonorrhoea and AIDS are commonly called? (1)

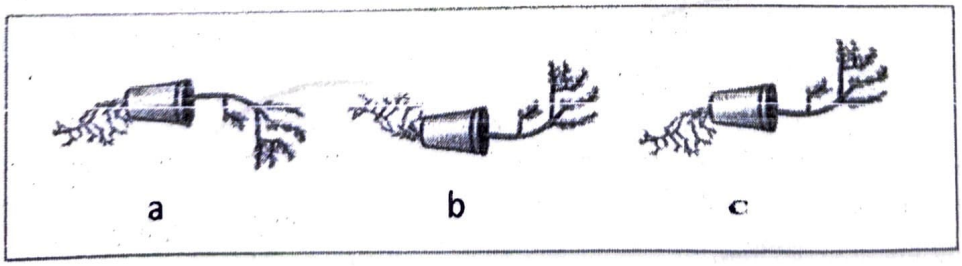
A. mineral deficiency disorders B. genetic disorders
C. sexually transmitted diseases D. both A and B are correct

4. Observe the diagram and identify the part where fertilisation takes place and the embryo develops

A. P and R, respectively
B. P and S, respectively
C. R and P, respectively
D. R and S, respectively (1)



5. Observe the figures given below. Which of the following depict tropic movements appropriately?



A. b and c B. a and c
C. Only b D. Only c (1)

6. In a given pregnancy, the probability of having a boy or a girl is:

A. 25% B. 50%

C. 75%. D. 100% (1)

7. Walking in a straight line and riding a bicycle are the activities which are possible due to the appropriate functioning of a part of brain. Choose the correct location and name of this part from the table given below (1)

	Location	Part
A	Forebrain	Cerebrum
B	Midbrain	Hypothalamus
C	Hind brain	Cerebellum
D	Hind brain	Medulla

8. Two statements, Assertion (A) and Reason (R) are given below. (1)

(A): Reabsorption of water from urine depends upon the amount of excess water in the body.

(R): Reabsorption of water from urine depends upon the amount of dissolved wastes that need to be excreted.

Answer the question 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.

9. Draw a well labelled diagram of stomata. Write any one role of stomata (1.5+0.5)

10. Identify 'a' and 'b' in the given flow chart of neuron through which information travels as an electric impulse. Write a function of any two parts of neuron. (1+1)

11. Write three differences between arteries and veins (3)

12. a) Draw a neat diagram showing germination of pollen on stigma of a flower. (3)

b) Label the following parts in it: pollen tube, stigma, female germ cell, male gamete

13. a) Construct a terrestrial food chain comprising four trophic levels.

b) What will happen if we kill all the organisms in one trophic level?

c) Calculate the amount of energy available to the organisms at the fourth trophic level, if the energy available to the organisms at the second trophic level is 2000J.

(1.5+1.5+2)

Source –based/ Case-based question

14. Mendel worked out the rules of heredity by working on garden peas using several visible contrasting characters. He conducted several experiments by crossing one or two pairs of contrasting characters of a pea plant. On the basis of his observations, he gave some interpretations which helped to study the mechanism of inheritance.

a) When Mendel crossed pea plants with pure tall and pure short characters to produce F1 progeny, which two observations were made by him in F1 plants?

b) When F1 plants were self-pollinated a total of 800 plants were produced. Draw a cross and show how many of these will be tall and short plants. Give the genotype of F2 generation.

(2+2)

SECTION B (Chemistry) **26 marks**

15. Identify the product 'X' obtained in the following reaction:

$CaCO_3 \xrightarrow{\Delta} \text{'X'} + CO_2$

A. Quick lime
B. Gypsum
C. Lime stone
D. Plaster of Paris
(1)

16. Which of the following gases can be used for storage of fresh samples of oil for a long time?

A. CO_2 and O_2
B. N_2 and O_2
C. CO_2 and He
D. He and N_2
(1)

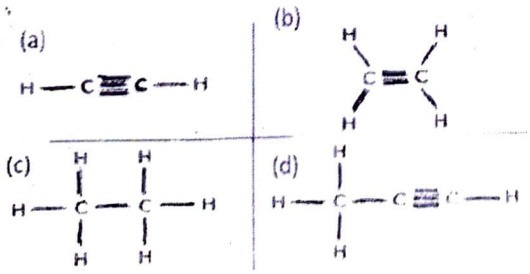
17. Cinnabar when heated in air first gets converted into ..... which is then reduced to ..... on further heating.

A. mercuric oxide; mercury
B. copper oxide; copper
C. manganese oxide, manganese
D. zinc oxide; zinc
(1)

18. Hard water does not produce lather with soap because it contains:

A. Only Mg2+ ions
B. Only Na2+ ions
C. Both Ca2+ and Mg2+ ions
D. Both Na+ and K+ ions
(1)

19. Which of the following structure(s) identifies as an alkyne(s).



A. Only (a)
B. only (b)
C. Both (a) and (d)
D. Both (b) and (c)
(1)

20. Which of the following metals exist in their native state in nature?

i) Calcium ii) Gold iii) Zinc iv) Silver

A. (i) and (ii) B. (ii) and (iii)

C. (ii) and (iv) D. (iii) and (iv) (1)

21. Two statements, Assertion (A) and Reason (R) are given below. (1)

(A): Ethanoic acid reacts with ethanol in the presence of an acid catalyst to form an ester.

(R): The ester gets converted back into alcohol when treated with an alkali.

Answer the question 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.

22. How would you distinguish between baking powder and washing soda by heating? (2)

23. Komal added dilute HCl to four metals and recorded her observations as shown in the table given below. Select the correct observation(s) and write the chemical equation of the reactions involved. (2)

Metal	Gas evolved
Copper	Yes
Iron	Yes
Magnesium	No
Zinc	Yes

24. a) Suggest a safe procedure of diluting a strong concentrated acid.

b) Name the salt formed when sulphuric acid is added to sodium hydroxide. Write its pH

c) Dry HCl gas does not change the colour of blue litmus paper. Why? (3)

25. With the help of an appropriate example, justify that some of the chemical reactions are determined by:

a) change in temperature

b) evolution of a gas

c) change in colour

Give chemical equation for the reaction involved in each cas (3)

26. a) Write the electron dot structure of Ca (at. no. 20) and O (at. no. 8).

b) Show the formation of Calcium oxide by transfer of electrons. Name the ions.

c) List four important characteristics of this compound. (1+2+2)

Source –based/ Case-based question

27. Homologous series is a series of compounds with similar chemical properties and same functional group differing from the successive members by –CH2 or 14 mass units. Members of a homologous series show a gradual change in the physical properties such as boiling and melting points, with the increase in molecular formula in the series.

a) Write the formula and the IUPAC name of the next homologue of CH3CH2OH.

b) To which homologous series do the following compounds belong?

i) CH3CH2COCH2CH3 ii) CH3CH2CH2COOH

c) C2H6 and C10H22 belong to the same homologous series. TRUE/ FALSE

d) Write the name and chemical formula of an aldehyde with 3 carbon atoms. (1+1+1+1)

SECTION C (Physics) **27 marks**

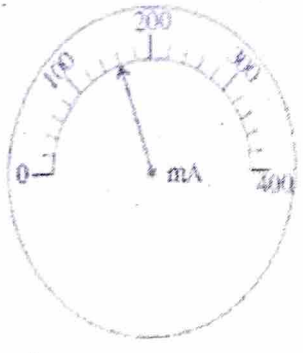
28. The angle of incidence for a ray of light passing through the centre of curvature of a concave mirror is: [1]

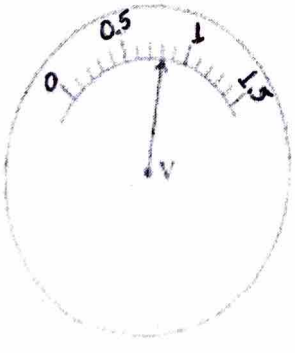
A. 0 degree B. 180 degree C. 90 degree D. 45 degree

29. In torches, search lights and head lights of vehicles, the bulb is placed: [1]

A. Very near to the focus
B. Between the focus and the centre of curvature
C. Between the pole and the focus
D. At the centre of curvature

30. When performing the experiment on Ohm's law noted the milli-ammeter reading and voltmeter reading. From the obtained readings, the value of resistance calculated by him will be



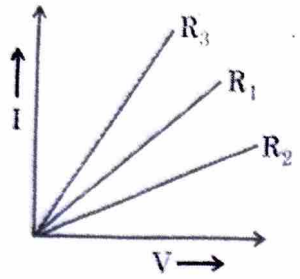


A. 0.05 Ω B. 5 Ω C. 0.005 Ω D. 0.5 Ω [1]

31. **Assertion (A):** The stars twinkle while the planets do not. [1]
Reason (R): The stars are much bigger in size than the planets.

A. Both A and R is true and R is the correct explanation of A.
B. Both A and R is 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.

32. A student plots V-I graphs for three samples of nichrome wire with resistances R_1, R_2 and R_3. Choose from the following statement that holds true for this graph. [1]



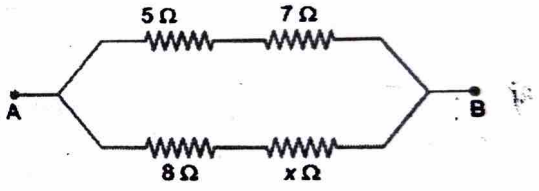
A. $R_1 = R_2 = R_3$ B. $R_3 > R_2 > R_1$

C. $R_1 > R_2 > R_3$ D. $R_2 > R_1 > R_3$

33. An object is kept at a distance of 1m from a lens of power +2D: [2]

a) Identify the type of lens.
b) Calculate its focal length and distance of the image formed.

34. In the circuit given below, calculate the value of x, if the equivalent resistance between the points A and B is 6 Ω. [2]



35. A divergent lens of focal length 30 cm forms the image of an object of size 6 cm at a distance of 15 cm from its optical centre. Use lens formula to determine the distance of the object from the lens and the size of the image formed. Draw a ray diagram to show the formation of image in the above situation. [3]

36. a) Calculate the cost of seeing 2 movies on colour T.V. daily for the month of September. Given wattage of colour T.V. = 60 W, the duration each movie is 2 hours 30 min and costs ₹4 per unit.

b) An electric kettle rated at 220 V, 2.2 kW works for 3h. Calculate the energy consumed and the current drawn. [3]

37. a) State two main causes of a person developing near-sightedness. With the help of a ray diagram, suggest how he can be helped to overcome his defect?

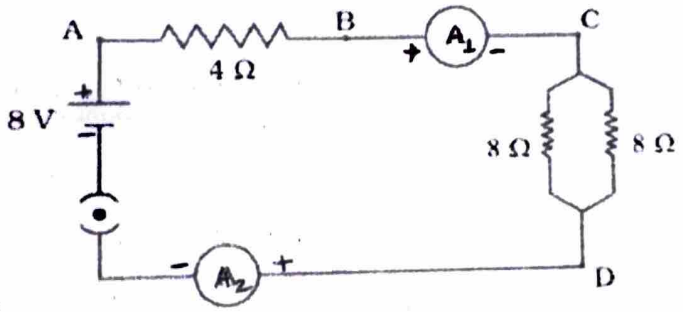
b) The far point of myopic person is 100 cm in front of the eye. Calculate the focal length and power of a lens required to enable him to see distant objects clearly. [3]

38. Read the following text carefully and answer the questions that follow:
Study the data given below showing the focal length of three concave mirrors A, B and C and the respective distances of objects placed in front of the mirrors:

Case	Mirror	Focal Length (cm)	Object Distance (cm)
1	A	20	45
2	B	15	30
3	C	30	20

a) In which one of the above cases the mirror will form a diminished image of the object? Justify your answer.
b) List two properties of the image formed in case 2.
c) An object is placed at a distance of 18 cm from the pole of a concave mirror of focal length 12 cm. Find the position of the image formed in this case.
(1+1+2)

39. Find out the following with reference to the electric circuit given below (5)



a) The effective resistance of two 8 Ω resistors in the combination
b) Current flowing through 4 Ω resistor
c) The potential difference across 4 Ω resistance
d) The power dissipated in 4 Ω resistor
e) The difference in ammeter readings, if any