# BK BIRLA CENTRE FOR EDUCATION

**SARALA BIRLA GROUP OF SCHOOLS**
**SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL**

**MID TERM EXAMINATION 2024-25**
**SCIENCE (086)**

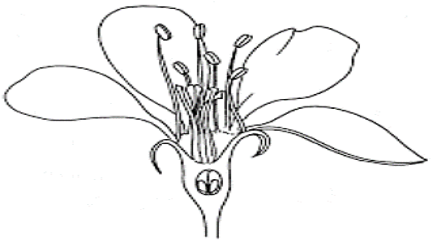
Class: X | Duration: 3 Hr
Date:23/09/2024 | Max. Marks: 80
Name: | Exam RNo.

General Instructions:

i. This question paper consists of 39 questions in 5 sections.
ii. All questions are compulsory. However, an internal choice is provided in some questions.
iii. Section A consists of 20 objective-type questions carrying 1 mark each.
iv. 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.
v. 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.
vi. 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.
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

## SECTION-A

1. A farmer wants to grow banana plants genetically similar enough to the plants already available in his field. Which one of the following methods would you suggest for this purpose? 1
   (a) Regeneration
   (b) Budding
   (c) Vegetative propagation
   (d) Sexual reproduction
2. What is the function of cotyledons in a germinating dicot seed? 1
   (a) To form the roots.
   (b) To provide a protective coat around the embryo.
   (c) To form the shoot system.
   (d) To provide nutrients to the embryo.
3. Which of the following statements is correct about receptors? 1
   (a) Gustatory receptors detect taste while olfactory receptors detect smell.
   (b) Both gustatory and olfactory receptors detect smell.
   (c) Auditory receptors detect smell and olfactory receptors detect taste.
   (d) Olfactory receptors detect taste and gustatory receptors detect smell.
4. Which of the following statements is true for flowers? 1



(i) Flowers are always bisexual
(ii) They are the sexual reproductive organs
(iii) They are produced in all groups of plants
(iv) After fertilization they give rise to fruits

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

5. If a tall pea plant is crossed with a pure dwarf pea plant then, what percentage of F1 and F2 generation respectively will be tall? 1
(a) 25%, 25% (b) 50%, 50%
(c) 75%,100% (d) 100%, 75%

6. Growth of pollen tube towards ovule during fertilisation is an example of: 1
(a) Phototropism (b) Geotropism
(c) Chemotropism (d) Hydrotropism

7. Which of the following are often called glands of emergency? 1
(a) Thyroid (b) Pituitary
(c) Adrenal (d) Pancreas

8. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object? 1
(a) Between the principal focus and the centre of curvature.
(b) At the centre of curvature.
(c) Beyond the centre of curvature.
(d) Between the pole of the mirror and its principal focus.

9. The change in focal length of an eye lens is caused by the action of the 1
(a) Pupil. (b) Retina.
(c) Ciliary muscles. (d) Iris.

10. Oxidation is a process which involves 1
(a) addition of oxygen (b) addition of hydrogen
(c) removal of oxygen (d) removal of carbon

11. Give the ratio in which hydrogen and oxygen are present in water by volume. 1
(a) 1:2 (b) 1:1
(c) 2:1 (d) 1:8

12. $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$ 1
Identify the substance oxidized in the above equation.
(a) $MnCl_2$ (b) HCl
(c) $H_2O$ (d) $MnO_2$

13. A substance 'X' is used in whitewashing and is obtained by heating limestone in the absence of air. Identify 'X'. 1
(a) $CaOCl_2$ (b) $Ca(OH)_2$
(c) CaO (d) $CaCO_3$

14. $Pb + CuCl_2 \rightarrow PbCl_2 + Cu$ 1

The above reaction is an example of:

(a) combination (b) double displacement

(c) decomposition (d) displacement

15. Brine is an 1

(a) aqueous solution of sodium hydroxide

(b) aqueous solution of sodium carbonate

(c) aqueous solution of sodium chloride

(d) aqueous solution of sodium bicarbonate

16. The poorest conductor of heat among metals is 1

(a) Lead (b) Mercury

(c) Calcium (d) Sodium

Question No. 17 to 20 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.

17. Assertion (A): The probability of survival of an organism produced through sexual reproduction is more than that of an organism produced through asexual mode. 1
Reason(R): Variations provide advantages to individuals for survival.

18. Assertion (A): Auxin hormone, synthesised at the shoot tip, helps the cells to grow. 1
Reason(R): It is a growth inhibitor hormone.

19. Assertion (A): Convex mirrors are use as rear view mirrors in vehicles. 1
Reason (R): Convex mirror always form virtual, erect and diminished image.

20. Assertion (A): Brown fumes are produced when lead nitrate is heated. 1
Reason (R): Nitrogen dioxide gas is produced as a by-product due to the decomposition of lead nitrate.

## SECTION-B

21. Draw a neat, labelled diagram of a pistil showing pollen tube growth and its entry into the ovule. 2

OR

(a) Explain the process of regeneration in Planaria. Draw a diagram also.

(b) What happens when (i) Bryophyllum leaf falls on the wet soil

(ii) On maturation sporangia of Rhizopus bursts?

22. How does chemical coordination occur in plants? 2

OR

Compare and contrast nervous and hormonal mechanisms for control and coordination in animals.

23. (a) Define S.I unit of power of the lens. 2

(b) What will be the power of a concave lens of focal length 50 cm?

24. Stars twinkle but planets do not. Why? 2

25. Explain the formation of NaCl by electron dot structure. 2

26. How is the sex of the child determined in human beings? 2

OR

How do Mendel's experiments show that traits may be dominant or recessive?

SECTION-C

27. A man with blood group A marries a woman with blood group B and their daughter has blood group O. Work out a cross to show possible genotypes. 3

28. A doctor has advised Sameer to reduce sugar intake in his diet and do regular exercise after checking his blood test reports. 3
(a) Which disease do you think Sameer is suffering from?
(b) Name the hormone responsible for this disease and the organ producing the hormone.
(c) Explain the feedback mechanism involved.

29. (a) Write laws of reflection. 3
(b) An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focussed image can be obtained?

30. A 2.0 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. Find the nature, position and size of the image. Also find its magnification. 3

31. Define myopia. Write different causes responsible for myopia. Explain the correction of myopic eye by suitable ray diagram. 3

32. (a) Why does calcium start floating when added to water? 3
(b) Most of the metals do not give hydrogen while reacting with nitric acid. Why?
(c) Write an equation for the reaction of iron with steam. Name the compound of iron obtained.

33. Identify the substances that are oxidised and the substances that are reduced in the following reactions. 3
(a) $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$
(b) $2PbO + C \rightarrow 2Pb + CO_2$

OR

State the type of chemical reactions, represented by the following equations :
(a) $A + BC \rightarrow AC + B$
(b) $A + B \rightarrow C$
(c) $PQ + RS \rightarrow PS + RQ$

SECTION-D

34. Given below are certain situations. Analyze and describe its possible impact on a person: 5
(a) The testes of a male boy are not able to descend into the scrotum during his embryonic development.
(b) The vas deferens of a man are plugged.
(c) Prostate and seminal vesicles are not functional.
(d) Egg is not fertilised in a human female.
(e) If fallopian tubes are blocked in a female.

OR

(a) What are the different modes of contraception? 2
(b) Draw and label the female reproductive part. 2
(c) Write the two functions of the ovary. 1

35. (a) Explain the power of accommodation of the human eye. 2
(b)The near point of a person is 80 cm in front of the eye. Identify the defect of vision of the person. What is the nature and power of the lens required to correct the problem? 3

OR

(a) Explain the phenomenon of dispersion of light. Show the process of recombination of white light using a suitable diagram. 3
(b) Explain the phenomenon of scattering of light. 2

36. (a) While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid? 2
(b) Which gas is generally liberated when an acid reacts with a metal? Illustrate with a suitable example. How will you identify and test for the presence of this gas? 3

OR

(i) A milkman adds a very less amount of baking soda to fresh milk. 3
(a) Why does he shift the pH value of the fresh milk from 6 to slightly alkaline?
(b) Why does this milk take as much time to set as curd?
(ii) Equal lengths of magnesium ribbons are taken in test tubes A and B. Hydrochloric acid (HCl) is added to test tube A, while acetic acid (CH3COOH) is added to test tube B.The amount and concentration taken for both the acids are equal. In which test tubes A and B will the fizzing occur intensely and vigorously? Give reasons. 2

## SECTION-E

**(**Question No.37-39 are case-based/data -based questions with 3 short sub-parts. Internal choice is provided in one of these sub-parts.)

37. The lenses form different types of images when objects are placed at different locations. When a ray is incident parallel to the principal axis, then after refraction, it passes through the focus or appears to come from the focus.
When a ray goes through the optical center of the lens, it passes without any deviation. If the object is placed between the focus and the optical center of the convex lens, an erect and magnified image is formed.
As the object is brought closer to the convex lens from infinity to focus, the image moves away from the convex lens from focus to infinity. Also, the size of the image goes on increasing and the image is always real and inverted.
A concave lens always gives a virtual, erect, and diminished image irrespective of the position of the object.
(a) An object is placed at infinity, what is the position and size of its image, formed by a convex lens? 1
(b) Write the position and size of the image formed, when the object is placed at the focus of a concave lens. 1
(c) Explain the working of a convex lens as magnifying glass.

OR 2

Differentiate between real image and virtual image. Write at least two differences.

38. Mendel blended his knowledge of Science and Mathematics to keep the count of individuals exhibiting a particular trait in each generation. He observed a number of

contrasting visible characters controlled in pea plants in a field. He conducted many experiments to arrive at the laws of inheritance. 1

(a) What do the F1 progeny of tall plants with round seeds and short plants with wrinkled seeds look like? 1

(b) Name the recessive traits in above case. 2

(c) Mention the type of the new combinations of plants obtained in F2 progeny along with their ratio, if F1 progeny was allowed to self pollinate.

OR

If 1600 plants were obtained in F2 progeny, write the number of plants having traits:

(i) Tall with round seeds

(ii) Short with wrinkled seeds

Write the conclusion of the above experiment.

39. 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. Chlorination of limewater is use to manufactured calcium oxy chloride.

(a) How would you prepare Bleaching powder? Give reaction. 2

(b) What happens when POP react with water? Give reaction. 2

OR

What is Chemical name of Washing soda? Write its formula.

**----------ALL THE BEST ----------**