

BK BIRLA CENTRE FOR EDUCATION

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

MID-TERM EXAMINATION 2023-24

SCIENCE (086)



B K BIRLA CENTRE
FOR EDUCATION
(Sarala Birla Group of Schools)



INDIAN PUBLIC SCHOOLS'
CONFERENCE

Class : X
Date : 18/10/2023
Admission No:
General Instructions:

Duration: 3 Hrs
Max. Marks: 80
Roll No.:

- 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. A student is expected to attempt only one of these 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. Answer 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

(Select and write the most appropriate option out of the four options given for each of the questions 1 - 20. There is no negative mark for incorrect response.)

1. What is formed when zinc reacts with sodium hydroxide?
(a) Zinc hydroxide and sodium (b) Sodium zincate and hydrogen gas
(c) Sodium zinc-oxide and hydrogen gas (d) Sodium zincate and water
2. $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ is;
(a) washing soda (b) baking soda (c) bleaching powder (d) tartaric acid
3. At what temperature is gypsum heated to form Plaster of Paris?
(a) 90°C (b) 100°C (c) 110°C (d) 120°C
4. How many water molecules does hydrated copper sulphate contain?
(a) 5 (b) 10 (c) 7 (d) 2

5. Give the ratio in which hydrogen and oxygen are present in water by volume.
 (a) 1:2 (b) 1:1 (c) 2:1 (d) 1:8
6. $\text{MnO}_2 + 4\text{HCl} \rightarrow \text{MnCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$
 Identify the substance oxidized in the above equation.
 (a) MnCl_2 (b) HCl (c) H_2O (d) MnO_2
7. What type of chemical reactions take place when electricity is passed through water?
 (a) Displacement (b) Combination (c) Decomposition (d) Double displacement
8. During respiration gaseous exchange takes place in _____.
 (a) Trachea and Larynx (b) Alveoli and blood vessels
 (c) Alveoli and throat (d) Throat and larynx
9. Proteins after digestion are converted into _____.
 (a) Carbohydrates (b) Small globules (c) Amino acids (d) starch
10. The mode of nutrition found in fungi is:
 (a) Parasitic nutrition (b) Holozoic nutrition (c) Autotrophic nutrition (d) Saprotrophic nutrition
11. The function of pituitary gland is _____.
 (a) to develop sex organs in males (b) to stimulate growth in all organs
 (c) to regulate sugar and salt in body (d) to initiate metabolism in body
12. How will information travel within a neuron?
 (a) Dendrite → cell body → axon → nerve ending (b) Dendrite → axon → cell body → nerve ending
 (c) Axon → dendrite → cell body → nerve ending (d) Axon → cell body → dendrite → nerve ending
13. The process where characteristics are transmitted from parent to offspring's is called;
 (a) Variation (b) Heredity (c) Gene (d) Allele
14. Each cell has two copies of each chromosome _____.
 (a) one each from male and female parents (b) from male parent
 (c) from female parent (d) any of above
15. Which of the following statements is true?
 (a) A convex lens has 4 dioptre power having a focal length 0.25 m.
 (b) A convex lens has -4 dioptre power having a focal length 0.25 m.
 (c) A concave lens has 4 dioptre power having a focal length 0.25 m.
 (d) A concave lens has -4 dioptre power having a focal length 0.25 m.
16. The danger signs made red in colour, because;
 (a) The red light can be seen from farthest distance.
 (b) The scattering of red light is least.
 (c) Both (a) and (b).
 (d) None of these.

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions 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):** Decomposition of vegetable matter into compost is an example of exothermic reaction.
Reason (R): Exothermic reaction are those reactions in which heat is absorbed.
18. **Assertion (A):** Insulin regulates blood sugar level.
Reason (R): Insufficient secretion of insulin will cause diabetes.
19. **Assertion (A):** Genes present in every cell of an organism control the traits of the organisms.
Reason (R): Gene is specific segment of DNA occupying specific position on a chromosome
20. **Assertion (A):** Convex mirror always forms virtual image.
Reason (R): Convex mirror is converging mirror.

Section-B

(Question No. 21 to 26 are very short answer questions)

21. What are the products formed when an acid reacts with a base? Give one example. 2
22. Briefly explain the parts of human digestive system. 2
23. What is goitre? Why is the use of iodised salt advisable? 2
24. Name the two types of plant movements and write differences between them. 2
- OR
- Name the hormones produced by Adrenal gland and Testis. Write one function of each.
25. (a) Define power of lens. Write its S.I unit. 2
(b) What will be the power of concave lens of focal length 20 cm?
26. Explain the phenomenon of dispersion of light by a glass prism. Draw the ray diagram of recombination of colour. 2

Section-C

(Question No. 27 to 33 are short answer questions)

27. (a) Identify the substance Oxidised, Reduced, oxidising agents and reducing agents in following reaction: 3
- $$\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$$
- (b) Define rancidity.
28. (a) On diluting an acid, it is advised to add acid to water and not water to acid. Explain why it is so advised?
- (b) Test the gas evolved first with dry and then with wet litmus paper. In which of the two cases, does the litmus paper show change in colour? 3

OR

How the following substances will dissociate to produce ions in their solutions?

- (a) Sodium hydroxide
- (b) Potassium hydroxide
- (c) Magnesium hydroxide
29. Sketch and label the structure of Nephron and add a brief note on its functions. 3
30. Mendel's experiments show that traits may be dominant or recessive. Mendel crossed a pure tall (TT) with pure dwarf (tt) pea plant. Derive the monohybrid phenotypic ratio. 3

31. (a) State and explain laws of refraction. 3
(b) Define absolute refractive index of a material. Absolute refractive index of a material is 2. Calculate the speed of light in the medium. Given: speed of light in vacuum is 3×10^8 m/s.
32. 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
33. Define myopia. Write different causes responsible for myopia. Explain the working of myopic eye and its correction by ray diagram. 3

Section-D

(Question No. 34 to 36 are long answer questions.)

34. (a) Three acidic solutions A, B and C have pH = 0, 3 and 5 respectively. 5
(i) Which solution has highest concentration of H^+ ions?
(ii) Which solution has the lowest concentration of H^+ ions?
(b) Explain chlor-alkali process. Name the product formed at cathode and anode.

OR

- (a) (i) Why does tooth decay start when the pH of mouth is lower than 5.5?
(ii) Arrange the following in the increasing order of acidic strength. Acetic acid, water and hydrochloric acid.
(b) How would you prepare baking soda in lab? Write chemical equation of the reaction involved.
35. With neat labelled diagram explain the internal structure of human heart. 5

OR

- Draw neat labelled diagram of human excretory system. Describe the steps of Urine formation.
36. (a) Explain the power of accommodation of human eye. 5
(b) The far point of a myopic person is 80 cm in front of the eye. What is the nature and power of the lens required to correct the problem?

OR

- (a) Explain atmospheric refraction.
(b) Stars twinkle but planets do not why?

SECTION - E

(Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.)

37. A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.
- (a) What is Decomposition Reaction? Give an Example. 2
(b) Define Redox Reaction. Give an example. 2

OR

Explain double displacement reaction with an example

38. Mendel was educated in a monastery and went on to study science and mathematics at the University of Vienna. Failure in the examinations for a teaching certificate did not suppress his zeal for scientific quest. He went back to his monastery and started growing peas Mendel blended his knowledge of science and mathematics and was the first one to keep count of individuals exhibiting a particular trait in each generation. This helped him to arrive at the laws of inheritance. He took pea plants because it had different characteristics, some were dominant and some were recessive. Pea plant exhibits many pairs of contrasting characters.

- (a) Why did Mendel select pea plant for his experiments? 1
- (b) What were the subjects in which Mendel was interested in? 1
- (c) Name any four pairs of contrasting characteristics of pea plant. 2

OR

What do you mean by dominant and recessive traits?

39. 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 a small and erect image of an object.

- (a) When an object is placed at the centre of curvature of a concave mirror. What are the properties of the image formed? 1
- (b) 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. What is the order of combinations for the magic mirror from the top? 1
- (c) A convex mirror has wider field of view. Write and explain two applications of convex mirror based on this property. 2

OR

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

-----**BEST OF LUCK**-----