ONE TWO ACADEMY CHALLENGE QUESTION PAPER 2023 – 24

SSLC SCIENCE

Maximum Marks: 70 marks Duration 3.00 Hours

Instructions: (1) Check the question paper for the fairness of printing. If there is any lack of fairness inform the Hall Supervisor immediately.

(2) Use Blue or Black ink to write and underline.

PART – I

Note: (i) Answer all the questions.

(ii) Choose the most appropriate answer from the given four alternatives and write the option code and the corresponding answer.

1. The velocity of a moving body of mass 5kg whose linear momentum 2.5 kg m s^{-1} is ___.

(a) 0.5 m s^{-1} (b) 5 m s^{-1} (c) 20 ms^{-1} (d) 5 m s^{-1}

2. The value of the universal gas constant (in mol^{-1} K^{-1})

(a) 3.81 (b) 8.03 (c) 1.38 (d) 8.31

3.The safe limit of receiving the radiation is about ____ per week (in mR).

(a) 200 (b) 500 (c) 1000 (d) 100

4.If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7, the nature of the bonding is

(a) ionic (b) covalent

5. Powdered $CaCo_3$ reacts more rapidly than flaky $CaCO_3$ because of _____ .

(a) large surface area (b) high pressure (c) concentration (d) temperature

6. Identify the incorrect statement

(a) Soaps cannot be used conveniently in hard water

(b)Hard soaps are used for washing.

(c) KETTLE PROCESS is one of the oldest methods to manufacture soap.

(d) A soap which has lower TFM is a good bathing soap.

7.All files are stored in _____.

(a) Folder (b) box (c) Pai (d) scanner

8. Where does alcohol effect immediately after drinking?

(a) Eyes (b) Auditory region (c) Liver (d) CNS

9. 9:3:3:1 ratio is due to

(a) Segregation (b) Crossing over (c) Independent assortment (d) Recessiveness

1**0.** The 'use and disuse theory' was proposed by _____.

(a) Charles Darwin (b) Ernst Haeckel (c) Jean Baptiste Lamarck (d) Gregor Mendel

11. Avena coleoptile test was conducted by

(a) Darwin (b) N. Smit (c) Paal (d) F.W. Went

12. Kreb's cycle takes place in

(a) chloroplast (b) mitochondrial matrix
(c) stomata (d) inner mitochondrial membrane

PART – II

Note: Answer any seven questions. **Question no 22** is compulsory.

13. Why does sky appear blue in colour.

14. Why does empty vessels produce more sound than filled one ?

15. Why ethene is more reactive than ethane?

16. What is the pH value of 1.0×10^{-5} M KOH solution?

17. What happens when $MgSO_4.7H_2O$ is heated?

18. State the applications of DNA fingerprinting technique.

19. What are the structures involved in protection of human brain ?

20.What is the role of fat in atherosclerosis ?

21. What are psychotropic drugs?

22. $_{92}U^{235}$ experiences one α decay. Find the number of neutrons in the final daughter nucleus that is formed ?

PART – III

Note: Answer any **seven** questions. Question no **32** is compulsory.

23. Draw the symbols for the following components

a) Ammeter b) Diode c) Galvanometer d) Resistor

24. a) The power of lens is -2 D. Find the focal length of the lens.

b) What is myopia? Suggest a remedy.

25. State and prove the law of conservation of linear momentum.

26. a) Define Relative Atomic Mass.

b) Define isotopes and give examples.

27. a) Write the IUPAC name of the simplest ketone and mention it's molecular formula.

b) Write any two characteristics of chemical equilibrium.

28. How does fossilization occur in plants?

29. a) How will you prevent soil erosion.

b) Differentiate phenotype and genotype.

30. With a neat labelled diagram explain the structure of neuron.

31. Complete the table

Phase	Days	Changes in ovary	Changes in Uterus	Hormonal changes
Menstrual		**Development of primary follicles.**		
Follicular				
Ovulatory	**14th day**			**LH peak**
Luteal				

32. a) Can a nickel spatula be use to stir a copper sulphate solution? Give reason.

b) How many grams are there in 2 moles of hydrogen molecules H_2?

c) Give the equation for the formation of rust.

PART – IV

Note: Answer all the questions. Draw diagrams wherever necessary.

33.

(a) i) A source producing a sound of a frequency of 500Hz is moving towards the listener with a velocity of 30ms^{-1}. The speed of the sound is 330ms^{-1}. What will be the frequency heard by the listener.

ii)State Newton's universal law of gravitation.

iii)What is an echo?

OR

(b) i) State the fundamental laws of gases.

ii) Give the uses of radioisotopes in industries.

iii) State Joule's law of heating.

34.

(a) i) The electron affinity value increases along the period from left to right and decreases down the group. Give reason.

ii)What is coefficient of cubical expansion.

iii)State Modern periodic law.

OR

(b) i) What is a supersaturated solution. Give example.

ii) A is a silvery white metal. A combines with O_2 to form at 800^oC, and the alloy of A is used in making the aircraft. Find A and B.

iii)Write notes on esterification reaction.

35.

(a) i) Minerals are not lost during the falling of leaves. Give reason.

ii) How cancer cell is different from normal cell.

iii) What are the glands embedded in Rabbit skin to regulate body temperature ?

OR

(b) i) What are Okazaki fragments?

ii) Natural selection is a driving force for evolution. How?

iii) Why do fossil fuels need to be conserved?