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Register No. 

## Half yearly Examination- 2025

Time :3.00 Hours

SCIENCE

Marks : 75

## PART I

Note: (i) Answer all the questions.

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

12x1=12

1. Impulse is equal to  
a) rate of change of momentum      b) rate of force and time  
c) Change of momentum      d) rate of change of mass.
2. If a substance is heated or cooled the change in mass of that substance is  
a) positive      b) zero      c) negative      d) none of the above
3. Velocity of sound in the atmosphere of a planet is 500 m/s. The minimum distance between the sources of sound and the obstacle to hear the echo should be  
a) 17m      b) 20m      c) 25 m      d) 50 m
4. Which of the following has the smallest mass?  
a)  $6.023 \times 10^{23}$  atom of He      b) 1 atom of He  
c) 2g of He      d) 1 mole atom of He.
5. The number of components in a binary solution is  
a) 2      b) 3      c) 4      d) 5
6. TFM in soaps represents content in soap  
a) mineral      b) vitamin      c) fatty acid      d) carbohydrates
7. Mammals are — animals  
a) cold blooded      b) warm blooded      c) Poikilothermic      d) All the above
8. Which nervous band connects the two cerebral hemisphere of brain?  
a) thalamus      b) hypothalamus      c) dendrites      d) corpus callosum
9. Syngamy results in the formation of —  
a) zoospore      b) conidia      c) zygote      d) chlamydo spores
10. The term ethanobotany was coined by —  
a) Khorana      b) J.W. Harshberger      c) Ronald Ross      d) Hugo de Vries
11. Which type of cancer affects lymph nodes and spleen?  
a) Carcinoma      b) Sarcoma      c) Leukemia      d) Lymphoma
12. Which is used to edit programs?  
a) Inkscape      b) Script editor      c) Stage      d) Sprite

## Part II

NOTE: (i) Answer any seven questions (ii) Question No: 22 is compulsory

7x2=14

13. State Snell's law.
14. How does a fuse core protect electrical appliances?
15. What is stellar energy?
16. Differentiate reversible and irreversible reaction
17. What is respiratory quotient?
18. Give reason: Guard cells are responsible for opening and closing of stomata

19. Identify the parts A, B, C and D in the given figure.



20. Fill in the blanks

a) \_\_\_\_\_ causes stomatal closure

Say true or false, if false correct the statement

b) Estrogen is secreted by corpus luteum

22. Calculate the pH of  $1.0 \times 10^{-4}$  molar solution of  $\text{HNO}_3$

### PART III

NOTE: i) Answer any seven questions. ii) Question NO: 32 is compulsory

7x4=28

23. Describe rocket propulsion.

24. Derive the ideal gas equation.

25. (i) Define atomicity.

(ii) Find the percentage of nitrogen in Ammonia.

26. (i) What is rust? Give the equation for formation of rust.

(ii) State two conditions necessary for rusting of iron.

27. Differentiate soaps and detergents.

28. Classify neuron based on its structure.

29. (i) The degeneration wing of a kiwi bird is an acquired character. Why is it an acquired character.

(ii) Why Archaeopteryx considered to be a connecting link?

30. (i) What are the various routes by which transmission of human immuno deficiency Virus (HIV) takes place?

(ii) What is metastasis.

31. Write short note on Mesophyll

32.  ${}_{88}\text{Ra}^{226}$  experiences three  $\alpha$ -decay. Find the number of neutrons in the daughter element

### PART IV

NOTE: Answer all the questions Draw diagrams wherever necessary.

3x7=21

33. a. (i) Why does the sky appear in blue colour

(ii) Differentiate the eye defects Myopia and Hypermetropia

OR

b (i) What is meant by reflection of sound;

(ii) what do you understand by the term ultrasonic vibration.

(iii) State two uses of ultrasonic vibration

(iv) State three animals which can hear ultrasonic vibration

34. a (i) What happens when  $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$  is heated? Write the appropriate equation.

(ii) In what way hygroscopic substances differ from deliquescent substance.

OR

b. Explain the types of double displacement reaction with example.

35. a (i) Discuss the importance of biotechnology in the field of medicine.

(ii) What is the importance of rain water harvesting.

OR

b. How is the structure of DNA organised? What is the biological significance of DNA?