ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E**

Code No. : 83-E

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತಶಾಸ್ತ್ರ, ರಸಾಯನಶಾಸ್ತ್ರ ಮತ್ತು ಜೀವಶಾಸ್ತ್ರ / **Physics, Chemistry & Biology**)

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

(ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Fresh)

General Instructions :

i) The Question-cum-Answer Booklet consists of objective and subjective types of questions having 52 questions.

ii) Space has been provided against each objective type question. You have to choose the correct choice and write the complete answer along with its letter in the space provided.

iii) For subjective type questions enough space for each question has been provided. You have to answer the questions in the space.

iv) Candidate should not write the answer with pencil. Answers written in pencil will not be evaluated. (Except Graphs, Diagrams & Maps)

v) Answer only one question each for the choice questions.

vi) Follow the instructions given against both the objective and subjective types of questions.

vii) In case of Multiple Choice, Fill in the blanks and Matching questions, scratching / rewriting / marking is not permitted, thereby rendering to disqualification for evaluation.

viii) **Space for Rough Work** has been printed and provided at the bottom of each page.

ix) Candidates have extra 15 minutes for reading the question paper.

x) Do not write anything in the space provided in the right side margin.

(SPACE FOR ROUGH WORK)

Four alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter in the space provided against each question. $10 \times 1 = 10$

1. The correct equation of nuclear fusion reaction is

   (A) ${}_1H^1 + {}_1H^1 \rightarrow H_2$ (B) ${}_1H^2 + {}_1H^1 \rightarrow {}_2He^4 + {}_0n^1$

   (C) ${}_1H^2 + {}_1H^2 \rightarrow {}_2He^4 +$ Energy (D) $2H_2 + 3H_2 \rightarrow 5H_2$.

2. The major constituent of freshly obtained molasses is

   (A) sucrose (B) fructose

   (C) glucose (D) methanol.

3. The minimum distance between the source of sound and the reflecting surface necessary to cause echo is

   (A) 1·7 m (B) 17 m

   (C) 7 m (D) 70 m.

4. In a triad of *A, B, C* elements if the atomic masses of *A* and *C* respectively are 100 and 200 then the atomic mass of *B* is

   (A) 300 (B) 175

   (C) 125 (D) 150.

5. If the fermentation of molasses during the manufacturing of ethyl alcohol is delayed then the conclusion that can be drawn is

   (A) molasses is diluted

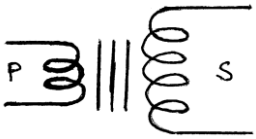
   (B) molasses is not diluted

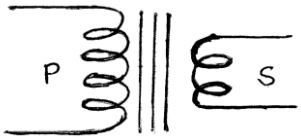
   (C) more yeast is added

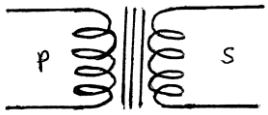
   (D) temperature is maintained around 410 K.

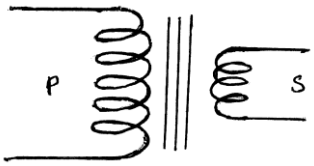
(SPACE FOR ROUGH WORK)

6. The transformer among the following in which output voltage is more than the input voltage is

(A) 

(B) 

(C) 

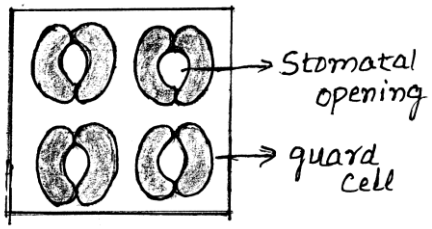
(D) 

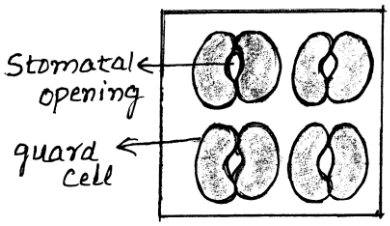
7. Which one of the following is biodegradable pollutants ?

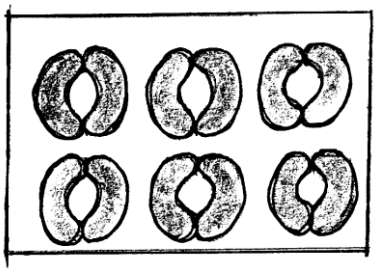
(A) Cowdung (B) DDT

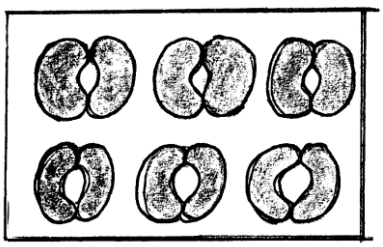
(C) Lead Vapour (D) Plastic.

8. In which one of the following water conservation is high, as rate of transpiration is low ?

(A) 

(B) 

(C) 

(D) 

(SPACE FOR ROUGH WORK)

9. The correct group among the following is

	Diseases	*Pathogen*	*Symptoms*
(A)	Hepatitis-B	HCV	Liver Cirrhosis
(B)	Syphillis	Neisseria	Ulcers on nose
(C)	Herpes	HSV	Blisters on and around genitals
(D)	Gonorrhoea	Treponema	Vaginal discharge.

10. A tall plant with red flowers is crossed with a dwarf plant with white flowers. Which one of the following represents dwarf plant with white flowers ?

(A) TtRr (B) TTrr

(C) ttrr (D) ttRr.

11. Names of alloys are given in **List-A**. Match them with their constituents given in **List-B** and uses given in the **List-C** : $4 \times 1 = 4$

List - A	*List - B*	*List - C*
(A) Stainless Steel	(a) Iron + nickel + cobalt + aluminium	(i) Electrical contact part
(B) Alnico	(b) Iron + carbon + chromium + nickel	(ii) Sports medal
(C) Invar Steel	(c) Copper + zinc + tin	(iii) Surgical instruments
(D) Brass	(d) Iron + carbon + nickel (large quantity)	(iv) Aeroplane body
	(e) Aluminium + copper + magnesium + manganese	(v) Permanent magnets
	(f) Copper + zinc	(vi) Precision measuring instrument.

(SPACE FOR ROUGH WORK)

Answer the following questions : $7 \times 1 = 7$

12. What is a Solar Cell ?

13. Name the process of converting crude oil obtained from seeds into commercially useful fuel.

14. Name two monosaccharide constituents of sucrose.

15. How can ceramic articles be given a coloured tinge ?

16. 'Soda glass must not be used in making laboratory heating apparatus.' Justify.

17. How are feathers useful to birds ?

18. The normal thyroxine level in an adult is around 0·8 ng/dl to 1·8 ng/dl. In a patient it was 0·6 ng/dl. After a prolonged hormonal treatment the thyroxine level was about 3·4 ng/dl. Mention the present symptoms of the patient.

Answer the following questions : $26 \times 2 = 52$

19. Write the function of the following parts of nuclear reactor along with the material used in making it :

    (a) Control rod (b) Moderator.

20. What are functional groups ? Name the class of compounds containing $— NH_2$ as the functional group.

21. Give scientific reason :

    (a) The atomic size increases down the group in the periodic table.

    (b) 18th group of periodic table is also called zero group.

22. Explain the method of extraction of amorphous silicon with the help of chemical equation.

OR

Write the balanced equations of chemical reactions taking place under the following circumstances :

(a) Steam is passed over red hot silicon.

(b) Silicon is burnt in air.

(SPACE FOR ROUGH WORK)

23. Calculate the period of a wave, which is having the wavelength 17 m and wave velocity 340 m/s.

24. Steam engines of Indian railways are replaced with diesel engines. Justify this move with two scientific reasons.

25. Gas *A* is four times denser than gas *B*. Find the ratio between their rates of diffusion.

26. Draw the diagram of a petrol engine.

27. Imagine that a listener who is at rest is listening to the sound of frequency 20 Hz produced by a stationary source. If the source starts moving away from the listener, will the listener be able to hear the sound ? Justify your answer.

28. Draw the diagram of blast furnace used in the extraction of iron.

29. Explain the process of industrial effluent treatment.

OR

Write the effects of acid rain on aquatic organisms and human beings.

30. Draw the diagram of a dicot plant.

31. Explain the structure of HIV.

32. 'Roof top gardening may be a solution for both energy crisis and management of kitchen wastes.' Justify the statement.

33. Mention any four characteristic features that are shared by humans with other primates.

OR

Mention any four features of Neanderthal Man.

34. 'Mammals are more evolved than amphibians.' Justify this statement with respect to circulation of blood and reproduction.

35. State Faraday's laws of electromagnetic induction.

36. Name four strokes of a petrol engine.

37. Draw the diagram of a single stage rocket.

(SPACE FOR ROUGH WORK)

38. State the following :

    (a) Charles' law (b) Boyle's law.

39. Write two differences between alkanes and alkenes.

40. Draw the diagram of electrolytic cell showing the purification of copper.

41. Draw the diagram showing the external features of fish.

42. What is reflex action ? Give an example.

43. Distinguish between monocot plant and dicot plant with regard to roots and leaves.

44. Name the components of blood.

Answer the following questions : $5 \times 3 = 15$

45. What are extrinsic semiconductors ? Write two differences between the two types of extrinsic semiconductors.

OR

What is biasing a diode ? Write two differences between the two kinds of biasing.

46. Draw the diagram of induction coil and label the following :

    (a) Primary coil (b) Make and break arrangement.

47. Draw the diagram showing electroplating of a brass article with silver and label the following :

    (a) Anode (b) Electrolyte.

48. Explain the structure and function of a neuron.

49. What is a monohybrid cross ? What is the ratio of tall and dwarf plants obtained in F_2 generation ? Represent the same with the help of a checker board.

OR

What is Biotechnology ? Mention any two advantages of biotechnology.

Answer the following : $3 \times 4 = 12$

(SPACE FOR ROUGH WORK)

50. What is Stellar evolution ? Explain the evolution of a star from its birth up to the red giant stage.

OR

State the principle of rocket. With respect to the launching of rocket, define orbital velocity and escape velocity. Write the relationship between them.

51. Write the structural formulae of the following :

(a) Butene (b) Ethyne

(c) Benzene (d) Cyclohexane.

OR

What is Catenation ? Write the structural formulae of the following :

(a) Cyclopropane, (b) Ethane, (c) Isobutane.

52. Draw the diagram showing the internal structure of human ear and label the following :

(a) Ear drum

(b) Cochlea.

(SPACE FOR ROUGH WORK)