

ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E**

Code No. : **83-E**

ವಿಷಯ : ವಿಜ್ಞಾನ

**Subject : SCIENCE**

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

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / **English Version** )

( ಹಳೆ ಪಠ್ಯಕ್ರಮ / **Old Syllabus** )

(ಪುನರಾವರ್ತಿತ ಅಭ್ಯರ್ಥಿ + ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / **Regular Repeater + Private Repeater**)

*General Instructions :*

- i) The Question-cum-Answer Booklet consists of objective and subjective types of questions having 55 questions.
- ii) This question-cum-answer booklet contains *two* Parts. **Part - A** contains the questions of Physics and Chemistry and **Part - B** contains Biology questions.
- iii) The question-cum-answer booklet has 36 questions in **Part - A** and 19 questions in **Part - B**.
- iv) 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.
- v) For subjective type questions enough space for each question has been provided. You have to answer the questions in the space.
- vi) Follow the instructions given against both the objective and subjective types of questions.
- vii) Candidate should not write the answer with pencil. Answers written in pencil will not be evaluated. ( Except Graphs, Diagrams & Maps )
- viii) In case of Multiple Choice, Fill in the blanks and Matching questions, scratching / rewriting / marking is not permitted, thereby rendering to disqualification for evaluation.
- ix) **Space for Rough Work** has been printed and provided at the bottom of each page.
- x) Candidates have extra 15 minutes for reading the question paper.
- xi) Do not write anything in the space provided in the right side margin.

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( **SPACE FOR ROUGH WORK** )

**PART - A**  
**( Physics & Chemistry )**

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 × 1 = 10

1. Electronic configuration of silicon is  
(A)  $1s^2, 2s^2 2p^6, 3s^2 3p^2$                       (B)  $1s^2, 2s^2 2p^6, 3s^2 3p^3$   
(C)  $1s^2, 2s^2 2p^6, 3s^2$                       (D)  $1s^2, 2s^2 2p^6, 3s^2 3p^4$ .
2. A cyclist bends towards the centre while going in a circular path to  
(A) move the cycle slowly  
(B) gain necessary centrifugal force  
(C) gain necessary centripetal force  
(D) increase the friction.
3. Which of the following is not a form of solar energy ?  
(A) Fossil fuel energy                      (B) Wind energy  
(C) Hydro energy                      (D) Nuclear energy.
4. The alloy that contains copper and zinc as its constituents, is  
(A) brass                      (B) bronze  
(C) german silver                      (D) gunmetal.
5. The measure to reduce energy crisis is  
(A) Wastage of water  
(B) Using fluorescent tubelights  
(C) Luxurious life style  
(D) Each individual uses his own vehicle.

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**( SPACE FOR ROUGH WORK )**

6. The reaction that is considered to be the source of solar energy is
- (A) radioactivity
  - (B) thermonuclear fusion reaction
  - (C) nuclear fission reaction
  - (D) chemical reaction.
7. The reducing agent used in the extraction of silicon is
- (A) Magnesium
  - (B) Silica
  - (C) Phosphorus
  - (D) Sulphur.
8. The apparent change in frequency of wave motion due to the relative motion between the source and the observer is known as
- (A) Raman effect
  - (B) Doppler effect
  - (C) Electromagnetic effect
  - (D) Tyndall effect.
9. An example for a pentavalent dopant is
- (A) Boron
  - (B) Antimony
  - (C) Gallium
  - (D) Indium.
10. The alkane among the following is
- (A)  $C_2H_2$
  - (B)  $C_2H_4$
  - (C)  $C_6H_6$
  - (D)  $C_2H_6$ .

Fill in the blanks :

$3 \times 1 = 3$

11. The device that converts solar energy into electrical energy is .....
12. The lightly doped region of a transistor is .....
13. The device used by the traffic control authorities to detect vehicle crossing speed limit is .....

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( SPACE FOR ROUGH WORK )

14. Match the names of hydrocarbons given in **Column-A** with their molecular formulae given in **Column-B**. Write the correct answer in the space provided : 4 × 1 = 4

<b>Column-A</b>	<b>Column-B</b>
(a) Benzene	(i) C <sub>4</sub> H <sub>10</sub>
(b) Propyne	(ii) C <sub>3</sub> H <sub>4</sub>
(c) Butene	(iii) C <sub>3</sub> H <sub>6</sub>
(d) Butane	(iv) C <sub>6</sub> H <sub>6</sub>
	(v) C <sub>4</sub> H <sub>8</sub>
	(vi) C <sub>4</sub> H <sub>6</sub>
	(vii) C <sub>2</sub> H <sub>2</sub> .

Answer the following questions : 6 × 1 = 6

15. Write the balanced chemical equation for the following chemical reaction :  
Magnesium reacts with dilute hydrochloric acid.
16. What is cracking ?
17. Define half-life period of a radioactive element.
18. What is uniform circular motion ?
19. Write the uses of a diode.
20. Name the system used to represent the brightness of a star.

Answer the following questions : 9 × 2 = 18

21. What is induced radioactivity ? Explain with an example.
22. Draw the diagram of a D.C. dynamo & label the parts.
23. What are propellants ? How do they work in vacuum ?
24. Write any four methods of conservation of water.
25. Draw the diagram of Helium-Neon laser tube and label the parts.
26. Write the differences between A.C. dynamo and D.C. dynamo.

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**( SPACE FOR ROUGH WORK )**

27. Draw the diagram of a single stage rocket and label the parts.
28. "Soaps are eco-friendly than detergents." Justify this statement.
29. Laser is used in eye surgery and industries. State the property of laser related to these uses.

Answer the following questions :

4 × 3 = 12

30. What is polymerisation ? Name one example each of the two types of synthetic polymers.
31. What is Raman effect ? Write the differences between Raman effect and Rayleigh scattering.
32. Draw the diagram of a nuclear reactor and label the following parts :
- (a) Moderator (b) Heat exchanger.
33. (a) State Universal law of gravitation.
- (b) The distance between the two bodies is increased by two times.

Explain with the help of mathematical formula of gravitational law, whether the gravitational force between two bodies increases or decreases and by how many times.

Answer the following questions :

3 × 4 = 12

34. (a) What are galaxies ? Name three types of galaxies.
- (b) Why do the sun spots appear dark in colour ?
35. Draw the diagram of an electrolytic cell used in the extraction of copper and label the following parts :
- (a) Cathode (b) Anode (c) Copper sulphate solution.
36. (a) Write the formula to calculate the efficiency of a heat engine.
- (b) Mention any three advantages of an internal combustion engine.

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( SPACE FOR ROUGH WORK )

**PART - B**  
**( Biology )**

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. 5 × 1 = 5

37. .... is commonly called personality hormone.
- (A) Adrenaline (B) Thyroxine  
(C) Insulin (D) Glucagon.
38. Which of the following vertebrates do not have teeth ?
- (A) Amphibia (B) Aves  
(C) Mammals (D) Reptiles.
39. The red pigment present in Polysiphonia is
- (A) Phycoerythrin (B) Phycocyanin  
(C) Chlorophyll (D) Xanthophyll.
40. The number of chambers in the heart of fish are
- (A) four (B) three  
(C) two (D) one.
41. The processes involved in oxygen cycle are
- (A) Nitrification, Respiration  
(B) Nitrification, Denitrification  
(C) Photosynthesis, Denitrification  
(D) Respiration, Photosynthesis.

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**( SPACE FOR ROUGH WORK )**

42. Match the names of epithelial tissues given in **Column-A** with their structure and location given in **Column-B**. Write the correct answer in the space provided : 4 × 1 = 4

**Column-A****Column-B**

- |                         |  |
|-------------------------|--|
| (a) Squamous epithelium | (i) elongated cells, larynx            |
| (b) Columnar epithelium | (ii) ciliated cells, small intestine   |
| (c) Ciliated epithelium | (iii) elongated cells, sweat gland     |
| (d) Cuboidal epithelium | (iv) ciliated cells, sweat gland       |
|                         | (v) flat cells, oesophagus             |
|                         | (vi) cube shaped cells, salivary gland |
|                         | (vii) flat cells, small intestine      |

Answer the following in a sentence each : 4 × 1 = 4

43. It is hard to detect the colour of objects during night in dim light. Give reason.
44. What is food adulteration ?
45. Human pinna is flexible. Why ?
46. Fibres are used to make gunny bags. Why ?

Answer the following questions in *two* or *three* sentences each : 6 × 2 = 12

47. Write any two characteristic features of reptiles.
48. What are the observations to be noted while purchasing packed fruit juice ?
49. Forests help to reduce global warming. Justify.
50. Mention any two disadvantages of using genetically modified foods.

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**( SPACE FOR ROUGH WORK )**

51. Write any two differences between reservoir pool and exchange pool.
52. A monocot leaf is more vulnerable to wear and tear than a dicot leaf.  
Why ?

Answer the following questions :

2 × 3 = 6

53. Explain the functioning of human ear.
54. Draw a diagram showing the structure of HIV and label any two parts.
55. Draw a diagram showing the vertical section of human eyeball and label the following : 4
- (a) Lens (b) Optic nerve.

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( SPACE FOR ROUGH WORK )