ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E**

Code No. : 83-E

CCE RF
CCE RR

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

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

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ + ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Fresh + Regular Repeater)

General Instructions :

i) The Question-cum-Answer Booklet consists of objective and subjective types of questions having 42 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.

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. In Fleming's right hand rule middle finger indicates the direction of
   (A) magnetic field (B) induced electric current
   (C) mechanical energy (D) motion of the conductor.
2. Identify one of the uses of solar heater in the following.
   (A) Conversion of solar energy into electrical energy
   (B) Providing energy for artificial satellites
   (C) Desalination of marine water
   (D) Using in automatic streetlights.
3. Significant reduction in the platelet count of human blood is the main symptom of this disease.
   (A) Chikungunya (B) Dengue
   (C) Bird flu (D) Gonorrhea.
4. Si + C → SiC. This chemical reaction is an example for
   (A) exothermic reaction (B) endothermic reaction
   (C) dissociation reaction (D) displacement reaction.
5. No image is formed on the blind spot of human eye because,
   (A) cones are absent (B) rods are absent
   (C) rods and cones are absent (D) optic nerve is absent.
6. A domestic electrical appliance requires alternating current of 15 V. If 220 V of alternating current is supplied to the house, then the device that helps in the functioning of that electrical appliance is
   (A) induction coil (B) step-up transformer
   (C) AC dynamo (D) step-down transformer.

(SPACE FOR ROUGH WORK)

7. While doing the experiment of copper voltameter, in which of the following cases, more amount of copper gets deposited at cathode ?

(A) 2 amperes of electric current is passed for 30 minutes

(B) 4 amperes of electric current is passed for 20 minutes

(C) 0·5 amperes of electric current is passed for 80 minutes

(D) 1·5 amperes of electric current is passed for 30 minutes.

8. Identify the correct complementary base pairing among the following.

(A) Adenine — Thymine and Guanine — Cytosine

(B) Adenine — Guanine and Thymine — Cytosine

(C) Adenine — Cytosine and Thymine — Guanine

(D) Guanine — Adenine and Cytosine — Adenine.

9. Find out the most efficient engine in the following.

(A) an engine converts 80 KJ of heat energy into 20 KJ of work

(B) an engine converts 50 KJ of heat energy into 15 KJ of work

(C) an engine converts 30 KJ of heat energy into 6 KJ of work

(D) an engine converts 60 KJ of heat energy into 24 KJ of work.

10. Haemoglobin levels in the blood samples of two persons *A* and *B* are found to be 9 gm/dL and 13 gm/dL respectively. Which statement is true with respect to the amount of oxygen supply in their body ?

(A) More in person *B* than in person *A*

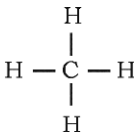
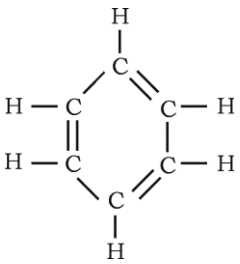
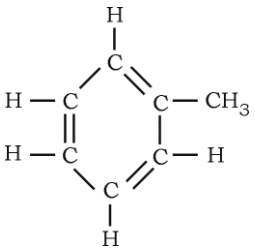
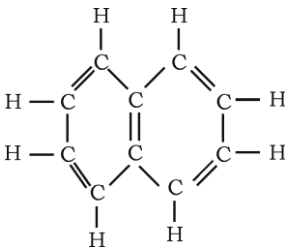
(B) More in person *A* than in person *B*

(C) Equal in person *A* and person *B*

(D) No correlation between oxygen supply and the level of haemoglobin.

(SPACE FOR ROUGH WORK)

11. The structural formulae of hydrocarbons are given in **Column-A** and their uses are given in **Column-B**. Match them and write the answers along with its letters in the space provided : $4 \times 1 = 4$

Column - A	***Column - B***
(A) 	(i) preparation of moth balls
(B) 	(ii) solvent for lacquers (iii) preparation of soap (iv) dry cleaning
(C) 	(v) used as fuel (vi) preparation of esters
(D) 	(vii) preparation of aspirin.

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

12. Write any two advantages of bio-energy.
13. What is red shift ?
14. Name the two important non-metallic oxides which cause acid rain.
15. Mention the properties of silica due to which it is used as sand bath in laboratory.

(SPACE FOR ROUGH WORK)

16. State the modern periodic law.

17. Draw the circuit symbol of *n-p-n* transistor.

18. Sclerenchyma fibres are used in coir industries to make gunny bags and ropes. Give scientific reason.

Answer the following questions : 16 × 2 = 32

19. Draw the diagram of a DC dynamo and label the following parts.

(a) Split rings (b) Armature coil.

20. What is annealing of glass ? Name the colour obtained when (i) Ferric compounds, (ii) Cobalt compounds are added to the mixture of molten glass.

OR

What is pulping ? How is an uncoated paper converted into coated paper ?

21. Draw the diagram of the apparatus used in electroplating and label the following parts.

(i) Electrolyte (ii) Anode.

22. Lymph plays an important role in protecting immune system of the body. Justify this statement.

OR

(a) How is dermal tissue adapted to prevent excessive transpiration in plants ?

(b) Why do leaves of lotus plant float on water ?

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

24. Differentiate between Caucasoid man and Mongoloid man based on their physical features.

25. What is forward biasing and reverse biasing of a diode ?

OR

What are extrinsic semiconductors ? Name the two types of extrinsic semiconductors.

(SPACE FOR ROUGH WORK)

26. Sodium (Na), Magnesium (Mg), Aluminium (A*l*) and Silicon (Si) are arranged in the decreasing order of their atomic size. Which element has the highest ionisation energy among them ? Justify your answer scientifically.

27. Draw the diagram showing the structure of HIV.

28. The densities of 4 gases at standard temperature and pressure are given in the table :

Gas	*Methane*	*Ammonia*	*Helium*	*Neon*
Density	0·72 g/L	0·77 g/L	0·18 g/L	0·90 g/L

Among these gases, which gas diffuses very fast ? State the law that helps you to take the decision.

29. Hydroponic and aeroponic methods are gaining significance in space research organisations. Give two reasons for this.

OR

Urban people should be encouraged to take up the practice of roof-top gardening. Justify.

30. What are ultrasonic waves ? Write any two uses of ultrasonic waves in the field of medicine.

OR

What is an echo ? Name the two devices which work on the principle of echo of ultrasonic waves.

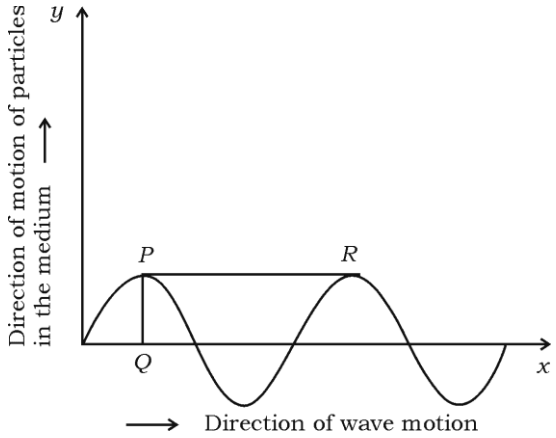
31. Hydroelectric power plants are more ecofriendly than thermal power plants. Justify this statement.

32. The general formula of a group of organic compounds is $C_nH_{2n+1}OH$.

Write the molecular formula of first two members of this group. Examine whether these two compounds are in homologous series, based on their molecular formula.

(SPACE FOR ROUGH WORK)

33. The graph of a wave motion is given below. Observe the graph and answer the following questions :



(a) What type of wave is represented in the graph ?

(b) What do *PQ* and *PR* indicate with respect to the wave ?

34. A student catches small aquatic creatures swimming in a pond and keeps them in his aquarium assuming them to be fishes. After a few days he observes that four limbs are developed in those creatures. Then,

(i) to which class of vertebrates do you include those aquatic creatures ?

(ii) name the process that has caused development of four limbs in them.

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

35. Draw the diagram of a nuclear power plant and label the following parts.

(a) Control rods (b) Radiation shield.

36. Name the steps in the manufacture of common sugar from sugarcane and explain the first step.

OR

(a) What is fermentation ? Give one example.

(b) Write the balanced chemical equations of the reactions taking place in the manufacture of ethyl alcohol from sugar.

(SPACE FOR ROUGH WORK)

37. (a) Bryophytes are used in pots. Why ?

(b) Explain alternation of generations in Bryophytes.

38. (a) Explain the expansion stroke of a petrol engine.

(b) There is no spark plug in diesel engine. Why ?

39. What is bio-technology ? List any two advantages and two limitations of biotechnology.

OR

(a) Why did Mendel choose pea plants for his experiments ? Give any four reasons.

(b) State Mendel's law of independent assortment.

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

40. (a) Which stage is attained by the star after the steady state ? Explain that stage.

(b) State Hubble's law.

(c) A satellite is to be launched from the surface of the earth. Name the factors on which the escape velocity of the satellite depends.

OR

(a) "Multistage rockets reduce the fuel consumption." How ? Explain.

(b) Explain how a neutron star is formed.

(c) In which stage of the star, does nuclear fusion reaction begin ?

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

(a) Organ of Corti (b) Auditory nerve.

42. (a) $2Mg + O_2 \rightarrow 2MgO$.

In this reaction, explain the experiment that you conduct to decide the product as a basic oxide.

(b) Name the method of concentration of Haematite ore and explain the method.

(SPACE FOR ROUGH WORK)