

M.M: 80

Time: 3 hrs.

GENERAL INSTRUCTIONS

- (i) All the questions are compulsory.
- (ii) This question paper consists of 39 questions in 5 sections.
- (iii) Section A consists of 20 objective type questions carrying 1 mark each.
- (iv) Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- (v) Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words.
- (vi) Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words..
- (vii) Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION -A

Q1. In which of the following the constituents are present in any ratio?

- | | |
|---------------------|--------------------|
| (a) Sodium Chloride | (b) Sulphuric acid |
| (c) Blood | (d) Carbon Dioxide |

Q2. Adityan visited an LPG unit and found that the gas can be liquefied at specific conditions of temperature and pressure. Help him to identify the correct set of conditions.

- (a) High temperature and high pressure
- (b) Low temperature and low pressure
- (c) Low temperature and high pressure
- (d) High temperature and low pressure

Q3. In which of the following conditions, the distance between the molecules of hydrogen gas would increase?

- (i) Increasing pressure on hydrogen contained in a closed container
 - (ii) Some hydrogen gas leaking out of the container
 - (iii) Increasing the volume of the container of hydrogen gas
 - (iv) Adding more hydrogen gas to the container without increasing the volume of the container
- | | |
|--------------------|-------------------|
| (a) (i) and (iii) | (b) (i) and (iv) |
| (c) (ii) and (iii) | (d) (ii) and (iv) |

Q4. During summer, water kept in earthen pot becomes cool due to

- | | | | |
|---------------|-------------------|------------------|-----------------|
| (a) Diffusion | (b) Transpiration | (c) Distillation | (d) Evaporation |
|---------------|-------------------|------------------|-----------------|

Q5. A mixture of sulphur and Carbon disulphide is

- (a) Heterogenous and shows tyndall effect
- (b) Homogenous and shows tyndall effect
- (c) Heterogenous and does not show tyndall effect
- (d) Homogenous and does not show Tyndall effect.

Q6. Arun has prepared 0.01% (by mass) solution of sodium chloride in water. Which of the following correctly represents the composition of the solutions?

- (a) 1.00g of NaCl + 100 g of water
- (b) 0.11 g of NaCl + 100g of water
- (c) 0.01g of NaCl + 99.99 g of water
- (d) 0.10 g of NaCl + 99.90g of water

Q 7. Which of the following is an example of gas in liquid mixture?

- (a) Air
- (b) Aerated water
- (c) Alcohol and water
- (d) Amalgamated Zinc

Q8. Dead element present in the phloem is

- (a) Phloem parenchyma
- (b) Phloem fibre
- (c) Sieve tubes
- (d) Companion cell

Q9. Name the stain used in plant cell staining

- (a) Methylene blue
- (b) Acetocarmine
- (c) Safranin
- (d) Leishman's Stain

Q10. Chromosomes are made up of

- (a) RNA
- (b) DNA + Protein
- (c) DNA
- (d) Protein

Q11. Chloroplast occur in

- (a) Chlorenchyma and Sieve tubes
- (b) Xylem parenchyma and Sclerenchyma
- (c) Collenchyma and Sclerenchyma
- (d) Parenchyma and Collenchyma

Q12. A long tree has several branches. The tissue that helps in the sideways conduction of water in the branches is

- (a) Collenchyma
- (b) Xylem parenchyma
- (c) Xylem vessels
- (d) Parenchyma

Q13. Upthrust on a body does not depend on

- (a) Density of liquid
- (b) Volume of body
- (c) Volume of liquid
- (d) Acceleration due to gravity

Q14. Two particles are placed at some distance from each other. If keeping the distance between them unchanged, the mass of each of the two particles is doubled, the value of gravitational force between them will become:

- (a) $\frac{1}{4}$ times (b) $\frac{1}{2}$ times (c) 4 times (d) 2times

Q15. A particle is moving in a circular path of radius r . The displacement after half a circle would be

- (a) Zero (b) πr (c) $2r$ (d) $2\pi r$

Q16. The structure of nuclear membrane is suitable for

- (a) Separation of chromosome
(b) The organisation of spindle for nuclear division
(c) Nucleo-cytoplasmic exchange of material
(d) Synthesis of protein

Question No. 17 to 20 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: a) Both A and R are true, and R is the correct explanation of A. b) Both A and R are true, and R is not the correct explanation of A. c) A is true but R is false. d) A is false but R is true.

Q17. Assertion (A): Cold drink bottle kept in freezer breaks.

Reason (R): Carbon dioxide gas present in the cold drink exerts high pressure on the walls of bottle when water changes into ice.

Q 18. Assertion (A): Living organisms are composed of cells and product of cells.

Reason (R): All cells arise from pre-existing cells.

Q19. Assertion: The slope of distance time graph gives acceleration of the body.

Reason: Greater the slope of distance: time graph, more is the speed of the body.

Q20. Assertion (A): Plant tissues are mostly dead.

Reason (R): Dead tissues can provide mechanical strength and need less maintenance.

SECTION -B

Q21. a) Why a balloon kept in a sun burst after sometime?

b) Latent heat of evaporation of two liquids A and B is 100 J/Kg and 150 J/Kg respectively.

Which one can produce more cooling effect and why?

Q22. Melting points of three substances A, B, C are 52°C , 175°C , and 80°C . Arrange them in the decreasing order of the interparticle force of attraction in each of them. Give reason for your answer.

Q23. a) Give the two differences between parenchyma and collenchyma.

b) The roots of a plant stops growing after removing the tips. Justify.

Q24. If a body jumps out from a boat, the boat moves backwards. Why?

Q 25. An electron moving with a velocity of $5 \times 10^4 \text{ m/s}$ enters into a uniform electric field and acquires a uniform acceleration of 10^4 m/s^2 in the direction of its initial motion. Calculate the time in which the electron would acquire a velocity double of its initial velocity.

Q26. In brief state what happens when.

- a) Genetic material (DNA) of chloroplast is removed.
- b) Endoplasmic reticulum is absent in the cell.

SECTION -C

Q27. With the help of an activity show that diffusion become faster with the increase in temperature.
(Material required, procedure, observation and conclusion)

- Q 28.** a) Sucrose (sugar) crystals obtained from sugar- cane and beetroot are mixed together. Will it be a pure substance or a mixture? Give reasons for the same.
- b) What is the main difference between aqueous solution and non- aqueous solution?
 - c) Why does solution of sodium chloride not show Tyndall effect whereas the mixture of water and milk shows?

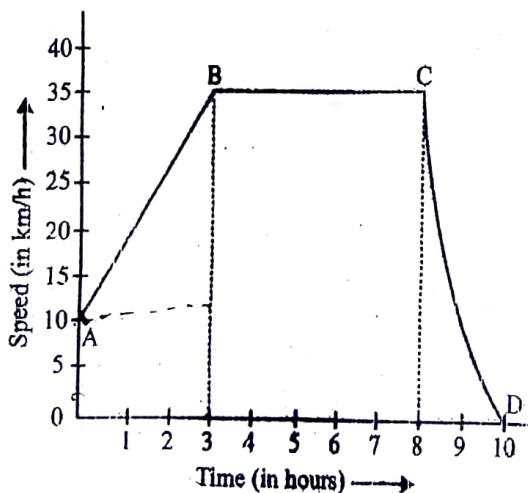
- Q29.** a) Name a chemical or molecule responsible for the stiffness of husk of the coconut. Draw the diagram and name the plant tissue found in the husk.
- b) "Conducting tissue is required for the survival of terrestrial plants". Justify the statement.

Q30. Landing alone on an island is scarier when you don't have anything to eat and drink. You can only see sea water for your survival, but that too is not good for your health.

- a) What will be the effect of consuming high amount of salty water on your body and why?
- b) How the shape of your RBC cell will change if it is kept in fresh water and why?

Q 31. How will you arrive at a mathematical formula to measure force using Second law of motion? Define the unit of force using the formula.

Q32. The graph given below shows how the speed of a car changes with time:



- (1) What is the initial and maximum speed of the car?
- (2) Which part of the graph shows
 - (a) zero acceleration
 - (b) Varying retardation
- (3) Find the distance travelled in the first 8 hours.
- (4) Q33. (a) Write four difference between mass and weight.
- (b) Why sharp knife cuts better than a blunt knife?

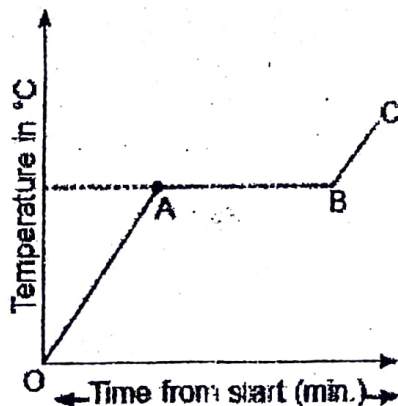
SECTION -D

- Q34. a) Calculate the amount of water required to prepare 500g of 2.5% solution of sugar.
b) In an experiment, 1.288 g of copper oxide was obtained from 1.03 g of copper. In another experiment, 3.672 g of copper oxide gave, on reduction, 2.938 g of copper. Show that these figures verify the law of constant proportion. State the law.
- Q35. a) Draw a labelled diagram of the plant part which takes part in transpiration process.
b) Which surface of leaf has maximum stomata and why?
c) How cork act as a protective tissue?
- Q36. (a) State Archimedes' principle.
(b) What is the force of gravity between the earth and mass of 1kg placed on its surface? (Mass of earth = 6×10^{24} kg, radius of earth = 6400km)?
(c) A cricket ball is dropped from a height of 20 m.
(i) Calculate the speed of the Ball when it hits the ground and
(ii) Calculate the time it takes to fall through this height. ($g=10\text{ms}^{-2}$)

SECTION- E

- Q 37. Read the given passage and answer the questions that follow based on the passage and related studied concepts.

Boiling occurs when the particles in a liquid state absorb enough energy to overcome the forces holding them together and begin to move apart to form a gas. A liquid is being heated, a graph is plotted between time and temperature in $^{\circ}\text{C}$. Answer the questions based on graph.



- a) What does OA show about kinetic energy?
b) What does AB represent?
c) Why does temperature remains constant at boiling point?
OR
c) i) What is represented by BC?
ii) What is represented by OA?

1. Carryout the following experiment:

Take four peeled potato halves and scoop each one out to make potato cups. One potato cup should be made from a boiled potato. Put each potato cup in a trough containing water.

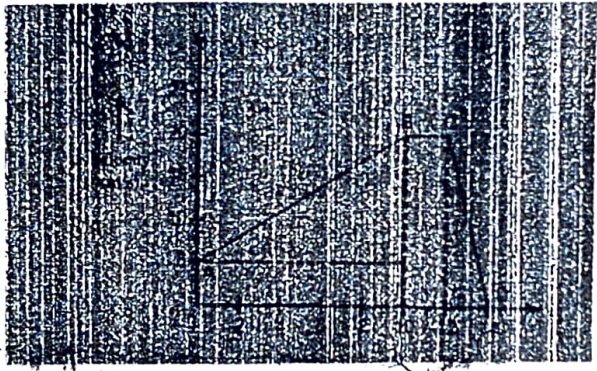
Now,

- (a) Keep cup A empty
- (b) Put one tea spoon sugar in cup B.
- (c) Put one tea spoon salt in cup C.
- (d) Put one tea spoon sugar in boiled potato cup D.

Keep these for 2 hrs. Then observe the four potato cups and answer the following

- i) Explain why water gathers in the hollowed portion of potato of B and C.
- ii) Why is potato A necessary for this experiment?
- iii) Explain why water does not gather in the hollowed out portions of A and D.

Q39. Observe the following v-t graph of a body moving on a straight road and answer the Questions that follow. Mass of the body is 40 kg.



(a) What force acts on the body from 10 s to 12 s time interval and why?
or

Calculate the force acting on the body from t=0s to t=10s.

- (b) In which time interval does the retarding force act on the body?
- (c) In which direction does frictional force act on a moving body? (2+1+1)