

Sample Question Paper - 10

Time Allowed: 3 hours

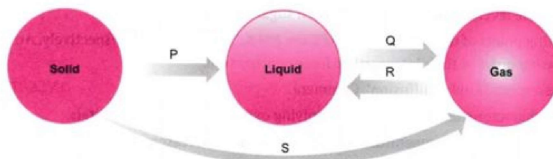
Maximum Marks: 80

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.
6. 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.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

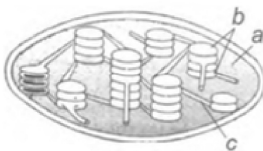
Section A

1. Which of the changes is/are exothermic? [1]

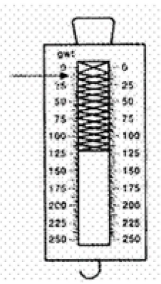


- [illegible]

2. Which of the following is correct for the given figure? [1]



- a) The parts labelled 'a', 'b' and 'c', all possess photosynthetic pigments such as chlorophyll.
- b) The part labelled 'a' is the site of dark reaction.
- c) The part labelled 'c' is called granum.
- d) The part labelled 'b' is called intergranal thylakoid.

3. The area under the velocity-time graph gives the value of: [1]
a) velocity
b) acceleration
c) mass
d) distance travelled
4. Induced breeding is used to increase the production of [1]
a) poultry birds
b) draught animals
c) cows
d) fish
5. Which of the following does not lose their nucleus at maturity? [1]
a) Red blood cells
b) Companion cells
c) Sieve tube cells
d) Vessel
6. 70-80% of the volume of a mature plant cell is occupied by: [1]
a) cytoplasm
b) vacuole
c) nucleus
d) endoplasmic reticulum
7. The chemical symbol for nitrogen gas is [1]
a) Ni
b) N
c) N₂
d) N⁺
8. Which of the following statements is the best description of the composition of blood? [1]
a) plasma and three types of cells
b) plasma and haemoglobin
c) serum and three types of cells
d) fibrin and three types of cells
9. In the following figure the zero error is: [1]

a) 5 gwt
b) - 5 gwt
c) 2 gwt
d) - 2 gwt
10. A body moving with uniform acceleration has velocities 20 ms⁻¹ and 30 ms⁻¹, when passing two points A and B. [1]
Then the velocity midway between A and B is:
a) 25.5 ms⁻¹
b) 24 ms⁻¹
c) 25 ms⁻¹
d) 10√6 ms⁻¹
11. The triad which is isoelectronic [1]
a) Mg²⁺, F⁻, O
b) Na⁺, O²⁻, Ne
c) Na⁺, Al, N₃⁻
d) Cl⁻, Ar, Ca
12. _____ in the cell wall of cork/bark makes it impervious to water. [1]

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section B

21. A man whose mass is 50 kg climbs up 30 steps of a staircase, each measuring 20 cm high, in 30 s. Calculate the power used in climbing the stairs. (Take $g = 10 \text{ ms}^{-2}$) [2]

OR

A man of mass 60 kg runs up a flight of 30 steps in 15 seconds. If each step is 20 cm high, calculate the power developed by the man. (Take $g = 10 \text{ m/s}$).

22. What happens when the temperature of the solids increase? [2]
23. Two children are at the opposite ends of a long iron pipe. One of them strikes the end of iron pipe with a stone. Find the ratio of time taken by the sound waves in air and in iron to reach the other child. (Speed of sound in air = 340 ms^{-1} and speed of sound in iron is 5130 ms^{-1}). [2]
24. Discuss the role of pressure and temperature in the liquefaction of a gas [2]
25. Why do you fall in the forward direction when a moving bus brakes to a stop and fall backward when it accelerates from rest? [2]

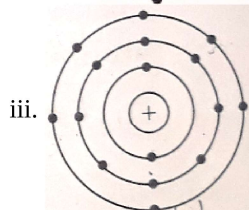
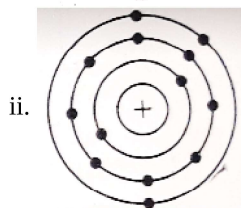
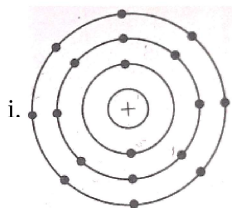
OR

Describe in brief an activity to illustrate the property of inertia of rest.

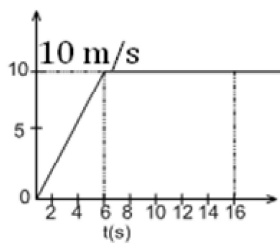
26. What are the limitations of J.J.Thomson's model of the atom? [2]

Section C

27. Represent graphically by two separate diagrams in each case [3]
- Two sound waves having the same amplitude but different frequencies?
 - Two sound waves having the same frequency but different amplitudes.
 - Two sound waves having different amplitudes and also different wavelengths.
28. Find out the valency of atoms represented by the following figures. [3]



29. The velocity time graph of runner is given in the graph. [3]



- a. What is the total distance covered by the runner in 16s?
- b. What is the acceleration of the runner at $t = 11\text{s}$?

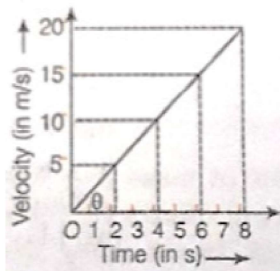
OR

The velocity of a body in motion is recorded every second as shown-

time (s)	0	1	2	3	4	5	6	7	8	9	10
velocity (m/s)	60	54	48	42	36	30	24	18	12	6	

Calculate the -

- a. acceleration
 - b. distance travelled and draw the graph.
30. Amit buys few grams of gold at the poles as per the instruction of one of his friends. He hands over the same [3]
when he meets him at the equator. Will the friend agree with the weight of gold bought? If not, why?
 31. The motion of a body of mass 5 kg is shown in the velocity-time graph. [3]



Find from the graph

- i. The acceleration.
 - ii. The force acting on the body.
 - iii. The change in momentum of the body in 2 s after the start.
32. Differentiate between plant cell and animal cell. [3]

OR

Do you agree "A cell is a building unit of an organism". If yes, explain why.

33. Diagrammatically show the difference amongst three types of muscle fibres. [3]

Section D

34. i. A person weighs 110.84 N on the moon, whose acceleration due to gravity is $1/6$ of that the earth. If the [5]
value of g on the earth is 9.8 m/s^2 , then calculate
 - a. g on the moon
 - b. mass of person on the moon
 - c. weight of person on the earth
- ii. How does the value of g on the earth is related to the mass of the earth and its radius? Derive it.

OR

What is the magnitude of the gravitational force between the earth and a 1 kg object on its surface? (Mass of the earth

is 6×10^{24} kg and radius of the earth is 6.4×10^6 m).

35. Explain main functional regions of a cell with the help of a diagram. [5]

OR

Make a comparison and write down ways in which plant cells are different from animal cells.

36. Name the process associated with the following: [5]

- Dry ice is kept at room temperature and at one atmospheric pressure.
- A drop of ink placed on the surface of water contained in a glass spreads throughout the water.
- A potassium permanganate crystal is in a beaker and water is poured into the beaker with stirring.
- An acetone bottle is left open and the bottle becomes empty.
- Milk is churned to separate cream from it.
- Settling of sand when a mixture of sand and water is left undisturbed for some time.
- Fine beam of light entering through a small hole in a dark room, illuminates the particles in its path.

Section E

37. **Read the text carefully and answer the questions:** [4]

In older plants, the outer protective layer that is epidermis undergoes certain changes the epidermis of the stem is replaced. There is cork cambium which is simple tissue having one type of the cell. The cells of cork cambium are rectangular and their protoplasts are vacuolated and contain tannins. The cork cambium gives off new cells from its both sides. The cells of the cork cambium are dead and compactly arranged without the intercellular space and there is suberin deposition.

- The epidermis of the cell is replaced by?
- How does cork act as a protective tissue?

OR

There is suberin deposition. What is the main disadvantage?

38. **Read the text carefully and answer the questions:** [4]

India has the maximum cattle population in the world. However, their productivity is less than half the productivity of many exotic breeds of cattle. The exotic breeds live in cold countries. They cannot live comfortably in hotter India. The only way to improve the productivity of Indian cattle is to produce hybrids which are acclimatised to Indian conditions and are resistant to most local diseases. For hybridisation, exotic bulls are kept in colder climate. Their semen is collected and cryopreserved. The same is sent to various parts of the country for artificial insemination.

- Mention two exotic breeds of cattle.
- Mention two hybrid breeds of cattle.
- Mention some factors governing the yield of milk.

OR

When can cattle be inseminated?

39. **Read the text carefully and answer the questions:** [4]

A solution of a solid in a liquid such as water can be prepared by adding it slowly to water with constant stirring at a certain temperature (room temperature). If the addition process is continued, a stage is ultimately reached in the dissolution process when no more of the solid dissolves. Rather it starts settling at the bottom of the container such as a glass beaker. The solution at this stage is said to be saturated. The solubility of a solute is always expressed with respect to the saturated solution. It may be defined as the maximum amount of the solute that can be dissolved in 100 g of the solvent to form a saturated solution at a given temperature. Please

remember that the role of temperature is very important. If temperature is increased, the solution becomes unsaturated. In case the temperature is decreased, the solution becomes supersaturated. As a result, crust of the solute gets deposited on the surface.

- (i) What do mean by the term Solubility?
- (ii) 20 g of a solute are dissolved in 500 g of the solvent. The solubility of the solute is:
- (iii) When a saturated solution becomes unsaturated?

OR

What do you mean by concentration of solution?