9th SCIENCE SA-1 Toppers fully Solved Sample Papers For Practice

1. Leaves of a tree may get detached if we vigorously shake its branch. Explain. [1]
2. A certain substance 'X' cannot be compressed but takes up the shape of any container in which it is placed. What will you regard its physical state? [1]
3. In what respect plastids are similar to mitochondria? [1]
4. The earth attracts the moon. Does the moon attract the earth? If it does, why does the earth not move towards the moon? [2]
5. Which separation technique will you apply for the separation of the following?
   (i) Different pigments from an extract of flower petals.
   (ii) Fine particles suspended in water. [2]
6. (a) What would happen to the life of a cell if there was no golgi apparatus? [2]
   (b) Which cell organelle detoxifies poison and drugs in liver of vertebrates?
7. Name the tissue that smoothens bone surface at joints. Describe its structure with the help of a diagram. [2]
8. A driver of train traveling at a speed of 15 m/s applies brake and retards the train uniformly. The train stops in 5 seconds. Another train B is traveling on a parallel track with a speed of 10 m/s. Its driver applies the brakes and the train stops in 10 seconds retarding uniformly. [3]
   (a) Plot speed-time graphs for train A and B on the same paper.
   (b) Calculate graphically which of the trains traveled farther after the brakes were applied.
9. Using Newton's universal law of gravitational and second law of motion, find the mathematical expression for acceleration due to gravity on the surface of any planet. [3]
10. When a person jumps from a building directly and another with a parachute put on, why does the latter not get hurt while the former is hurt? [3]
11. A ball is thrown vertically upwards with a velocity of 49 m/s. Calculate: [3]
    (a) The maximum height to which it rises.
    (b) The total time it takes to return to the surface of the earth. (take g= 9.8 m/s^2)
12. (a) Define momentum and give its S.I. unit. [3]
    (b) An object experiences a net zero external unbalanced force. Is it possible for the object to be traveling with a non-zero velocity? If yes, state the conditions that must be placed on the magnitude and direction of the velocity. If no, provide a reason.
13. (a) Why it is not proper to regard the gaseous state of ammonia as vapours?
    (b) List any four important charactertics of liquid state. [3]

14. (a)Can physical and chemical changes also occur together? Illustrate your answer.
(b) Fog and cloud are both colloidal in nature. How do they differ? [3]

15. Explain mixed cropping method with the help of an example. Give any one advantage of using such a method.
[3]

16. How is meristematic tissue classified on the basis of its location? Draw a well labeled diagram to show the location of meristematic tissue plant body.
[3]

17. (a) What are pesticides?
[3]
(b) Why excessive use of pesticides not advisable?
(c) Name two preventive measures against pests.

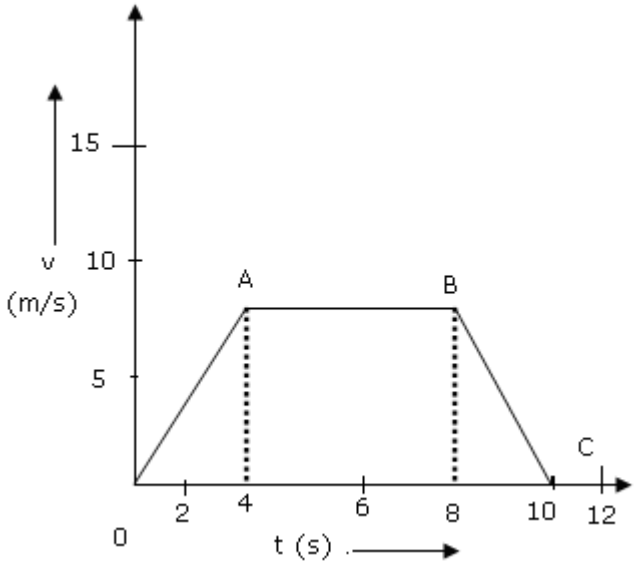
18. (a) What is osmosis?
[3]
(b) What happens to a cell when it is placed in hypotonic, isotonic and hypertonic solutions respectively?
(c) What is plasmolysis?

19. Name the fat storage tissue where this tissue is present? What specialty is attained by this tissue due to the storage of fat?
[3]

20. (a) State the law of conservation of momentum. [5]
(b) Explain how the third law of motion reasons the recoil of gun.
(c) A bullet of mass 20 g is horizontally fired with a velocity of 150 m/s from a pistol of mass 2 kg. What is the recoil velocity of the pistol?

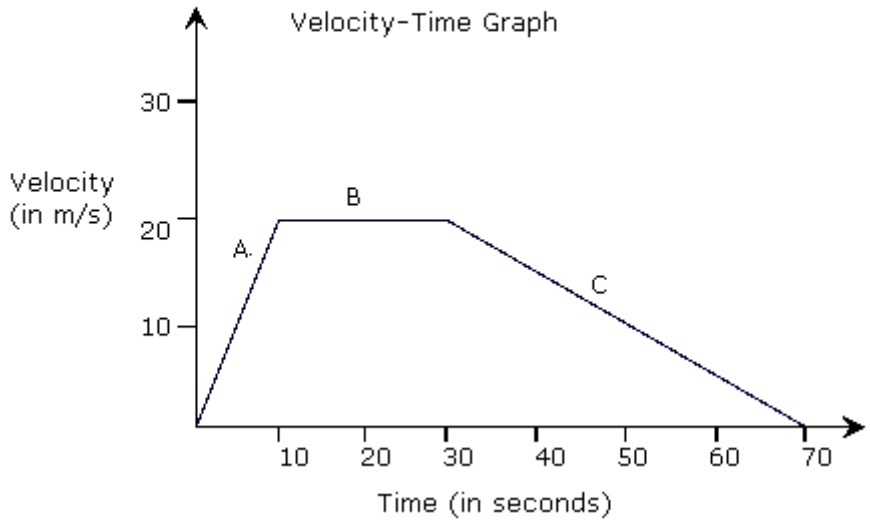
OR

(a) Define force and give its SI unit.
(b) The speed- time graph of a car of 1000kg mass is given below. From the graph answer the following:



(i) When is the maximum force acting on the car? Why?
(ii) What is the retarding force?
(iii) For how long is there no force acting?

21. (a) Draw a Velocity - Time graph for an Object with Constant Acceleration.
(b) Draw a Velocity - Time graph for an Object with Constant velocity. [1]
(c) In the given graph, compare the acceleration the body undergoes in region A and C.



[3]

OR

(a) A car is moving with a speed of 10 m/s. When the brakes are applied, the car has a constant negative acceleration (slows down) of -2 m/s^2. What is its stopping distance? [3]

(b) A motor boat starting from rest on a lake accelerates in a straight line at a constant rate of 3 m/s^2 for 8.0 s. How far does the boat travel during this time? [2]

22. (a) What do you understand by homogeneous and heterogeneous mixture? Give one example for each type.

(b)Classify the following as pure substances or mixture: milk, air, iron, distilled water. [5]

OR

(a) Give any four application of colloidal solutions.

(b) Distinguish between physical and chemical change

Q23 (a) Distinguish solids and gases in a tubular form on the basis of the following characteristics:

(i) Inter particle forces of attraction.

(ii) Compressibility

(iii) Rigidity

(iv) Inter particle spaces

(v) Kinetics energy of particles [5]

OR

(a) What is the reason for the existence of the three states of matter?

(b) Tarun got an invitation to attend a party. On coming to his place, he found that his shirt and pent were wet. What any three ways he would take to dry them quickly?

(c) What is common in the three states of matter? [5]

24. (a) On what factors does the growth of plants and flowering are dependent?
(b) What preventive and control measures should be taken before storage of grains?
(c) Mention any two points to differentiate between manures and fertilizers.

[5]

OR

(a) Name any two fodder crops which are raised as food for the livestock.

(b) For good production of poultry birds, what kinds of management practices are important?

(c) Why should biological control methods be preferred for protecting crops?

Section: B

25. Least count of the spring balance is _____ weight or mas that can be measured by the spring balance.
(a) minimum
(b) maximum
(c)average

26. Range of the spring balance helps us know the _____weight or mass that can be measured by the spring balance.
(a) minimum
(b) maximum
(c)average

Q27. Rohit mixed starch with water. He boiled the mixture well and stirred it. He observed that-

a) Starch floats on the surface of water.

b) Starch settles down at the bottom.

c) Starch forms a translucent mixture

d) Starch forms a transparent mixture

Q28. The size of the colloidal particles range between:

a) 10^{-2} cm to 10^{-3} cm

b) 10^{-3} cm to 10^{-5} cm

c) 10^{-5} cm to 10^{-7} cm

d) 10^{-7} cm to 10^{-8} cm

Q29. Burning of carbon with oxygen is

a) Physical change

b) Chemical change

c) Exothermic change

d) Spontaneous change

Q30. $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$ is

a) Combination reaction

b) Decomposition reaction

c) Displacement reaction

d) Double displacement reaction

Q31. Specific heat capacity of a substance depends upon

a) Volume

b) Mass

c) Temperature

d) Nature

Q32.The amount of water vapours present in atmosphere is called

a) Absolute humidity

b) Humidity

c) Relative humidity

d) Vapourisation

Q33. The property of sublimation shows the direct conversion of:

a) Solid to liquid and liquid to solid

b) Solid to gas and gas to solid

c) Solid to solid

d) Liquid to gas

Q34. Name the substance of the mixture which reacts with dil. HCl and gives hydrogen gas?

a) Sand

b) Wax

c) Iron

d) Methane

Q35. The substance which loses electron is called as

a) Oxidising agent

b) Reducing agent

c) Catalyst

d) Enzyme

Q36. Out of these which one shows the physical change?

a) Melting of wax

b) Rusting of iron

c) Formation of curd

d) Burning of magnesium

37. We use glycerin in temporary mount of the material because:

(a) it avoids drying of the material.
(b) it provides the medium for floating the material.
(c) it increases the beauty.
(d) it increases the clarity of the material.

38. Given below are four steps for preparing a temporary mount of human cheek cells.
(I) Rinsing the mouth with fresh water and disinfectant solution.
(II) Putting a drop of glycerin on the material.
(III) Adding two or three drops of methylene blue.
(IV) Take scraping from inner side of cheek and spreading it on a clean side.
Arrange them in correct sequence:

(a) IV, III, II, I

(b) IV, II, III, I

(c) I, IV, III, II

(d) I, IV, II, III

39. Which of the following tissue is cells that are irregularly thickened at the corners.

(a) Parenchymatous tissue (b) Collenchymatous tissue
(c) Sclerenchymatous tissue (d) Meristematic tissue

40. A sample of milk was treated with a few drops of iodine solution. The milk sample developed blue colour. This shows the presence of which impurity?

(a) Water (b) Starch
(c) Metanil yellow (d) None of above

41. Pick the odd one out of the following:
[1]
(a) Cell body (b) Axon
(c) Light and Dark bands (d) Dendrites

42. A sample of adulterated dal was taken in a test tube, 2ml of water was added to it and it was treated by dil. HCl to detect the presence of which of the following substance.

(a) Methyl orange (b) Congo red
(c) Metanil yellow (d) Chrome Yellow

Solution of Sample Paper

SECTION A

1. Initially both the tree and the leaves are at rest. When the tree is shaken vigorously the tree is set into motion. Due to inertia of rest, the leaves tend to remain at rest, and as a result fall off. [1]

2. The physical state of the substance 'X' is a liquid. [1]

3. Plastids are similar to mitochondria as both of them have their own DNA and ribosomes.

4. Both the earth and the moon attract each other with same force [1]
Since mass of earth is much more than that of the moon, the acceleration produce in the earth is negligible [1]

5. (i) Chromatography [1]
(ii) Sedimentation [1]

6. (a) The materials synthesised in ER will not be (packaged), (stored) and (transported) to various targets and lysosome formation will also not take place.

[1½]

(b) Endoplasmic reticulum.

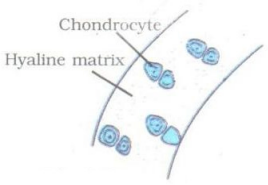
[½]

7. Cartilage

[½]

Cartilage is type of connective tissue that has widely cells/ It has solid matrix which contains proteins and sugars.

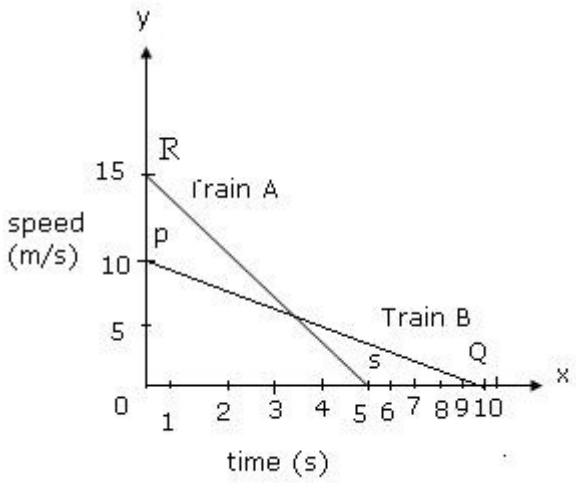
[½]



[1]

[1/2 x 4]

8. Speed-time graph for A and B: [1]



Distance traveled by train A= area under straight line graph RS
= area of triangle ORS

$$= \frac{1}{2} \times OR \times OS \frac{1}{2} \times 15 \times 5\,m \quad [1]$$

$$= 37.5\,m$$

Distance traveled by train B= area under PQ= area of triangle OPQ

$$= \frac{1}{2} \times OP \times OQ = \frac{1}{2} \times 10 \times 10$$

= 50 m [1]

Thus, train B traveled farther after the brakes were applied.

9. Let us consider an object of mass m above the surface of a planet of mass M, let radius of the planet= R, from universal law of gravitation, Gravitational force of attraction [1]

$F= GmM/R^2$ .....(i)

From Newton's second law of motion, the magnitude of gravitational force F is

F= mg .....(ii) [1]

Where g is the acceleration due to gravity

Comparing (i) and (ii)

$mg= GmM/R^2$

or $g= Gm/R^2$ [1]

10. When a person jumps directly from a building, the momentum gained by him is instantly transferred when he hits the ground at a high velocity with the velocity coming to zero. However if he jumps with a parachute, the air resistance acting on the parachute considerably reduces the velocity of the person when he is close to the ground. Hence the transfer of momentum due to sudden change of velocity to almost zero , which is very mild and hence he is not hurt. [3]

11. According to the equation of motion:

$V^2-u^2 = 2as$

Where,

u= Initial velocity of the ball

v= Final velocity of the ball

s= Height achieved by the ball

a= Acceleration

At maximum height, final velocity of the ball is zero, i.e., v= 0

$u = 49 m/s$

During upward motion, $a = -9.8\ ms^{-2}$
Hence,
Let h be the maximum height attained by ball.

$0 - (49)^2 = 5 \times (-9.8) \times h$

[1]

$h = \frac{49 \times 49}{2 \times 9.8} = 122.5\,m$

Let t be the time taken by the ball to reach the height 122.5 m, then according to the equation of motion:
V= u+at
We get,

$0 = 49 + t \times (9.8)$

$9.8t = 49$ [1]

$t = \frac{49}{9.8} = 5\,s$

But, Time of ascent= Time of descent
Therefore, total time taken by the ball to return= 5+5= 10 s [1]

12. (a) Momentum of an object is defined as a product of its mass and Velocity. [½]
Its S.I. unit is $kgms^{-1}$ [½]
(b) Yes. Even when an object experience a net zero external unbalanced force, it is possible that the object is traveling with a non-zero velocity. This is possible only when the object has been moving with a constant velocity in a particular direction. [1] [1]

13. (a) The gaseous state of a substance can be regarded as vapours only in case it is a liquid at room temperature. Since ammonia is a gas at room temperature, its gaseous state cannot be regarded as vapours. [1]

(b) Four important characteristics of liquid state are:
(i) Liquids do not have fixed shapes.
(ii) Liquids have fluidity and not rigidity.
(iii) Particles in the liquid state can easily diffuse.
(iv) The kinetics energy of the particles in the liquid state is more than in the solid state.

14. (a) In some cases, the physical and chemical changes can occur together. For example the burning of candle. The wax present in the candle changes to liquid state. This means that the change is of physical nature. [1]
At the sametime, the constituent's carbon and hydrogen present in wax react with the oxygen of air ton form new substances. This means that a chemical reaction or change is also taking place. Moreover, in this case when the molten wax solidifies after sometime, its composition does not remain the same.

[1]

(b) Both fog and cloud are the examples in which liquid is the dispersed phase and gas is the dispersion medium. The only difference between them is that clouds are formed in the upper atmosphere while fog gets formed in the region close to earth.

[1]

15. Mixed cropping: Growing two or more crops simultaneously on the same piece of land

[1]

whea+ gram or wheat+mustered

[1]

Advantage of mixed cropping:
Reduces risk and gives insurance against failure of one crop

[1]

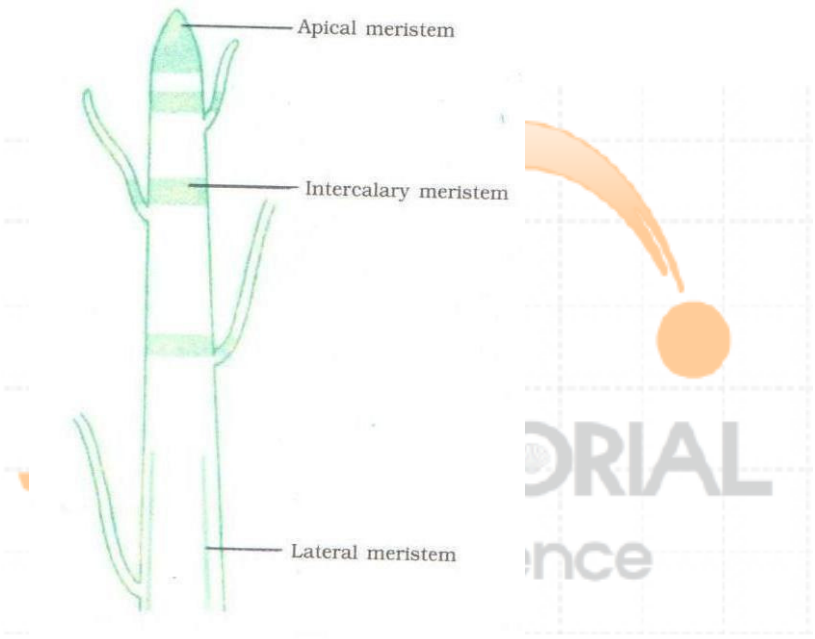
16. Types of Meristematic tissue:

(1) Apical Meristem: Present at growing tips of stems and roots. It increases the length of the stem or root.

(2) Intercalary Meristem: It is present at the base of leaves or internodes and increases the length of the stem.

(3) Lateral Meristem: It is present on the lateral sides of the stem and increases the girth of the stem and root.

[1½]



[1½]

17.

(a) Chemicals which are used to kill insect pests, fungi, weeds and rodents are called pesticides

[1]

(b) Cause environmental pollution.

[1]

(c) Use of resistant varieties and summer ploughing.
[½+½]

18. (a) Osmosis: It is the passage of water from a region of high water concentration through a semi – permeable membrane to a region of low water concentration. [1]

(b) (i) Cell placed in Hypotonic Solution:

Swelling of cell occurs due to osmotic entry of water into it.

[½]

(ii) Cell placed in Hypertonic Solution:

Shrinking of cell contents due to exosmosis.

[½]

(iii) Cell placed in Isotonic Solution:

No change

[½]

(a) Plasmolysis: Shrinkage of cell content when placed in hypertonic solution.

[½]

19. Adipose tissue is fat storage tissue.
It is found below the skin and between internal organs.
The cells of this tissue are filled with fat globules which enable it to act as an insulator.

[3]

20. (a) If a group of bodies are exerting force on each other, [1]
their total momentum remains conserved before and after the interaction provided there is no external force acting on them.
(b) When a gun is fired, it exerts a forward force on the bullet. [1]
The bullet exerts an equal and opposite reaction force on the gun. This result in the recoil of the gun. Since the gun has a much greater mass than the bullet, the acceleration of the gun is much less than the acceleration of the bullet.
(c) We have the mass of bullet, [1]

$m_1 = 20g (= 0.02\,kg)$

and the mass of the pistol

$m_2 = 2\,kg;$

Initial velocities of the bullet (u_1) and pistol $(u_2) = 0$, respectively.

The final velocity of the bullet, $v_1 = +150\,m/s.$

The direction of the bullet is taken from left to right.

Let v be the recoil velocity of the pistol.
Total momenta of the pistil and bullet before the fire, when the gun is at rest
= (2+0.02) kg. 0 m/s
= 0 kg m/s
Total momenta of the pistol and bullet after it is fired
= 0.02 kg. (+ 150 m/s) + 2 kg. v m/s [1]
= (3+2v) kg m/s
According to the law of conservation of momentum [1]
Total momenta after the fire= Total momenta before the fire
3+2v = 0
V= -1.5 m/s
Negative sign indicates that the direction in which the pistol would recoil is opposite to that of bullet, that is, right to left

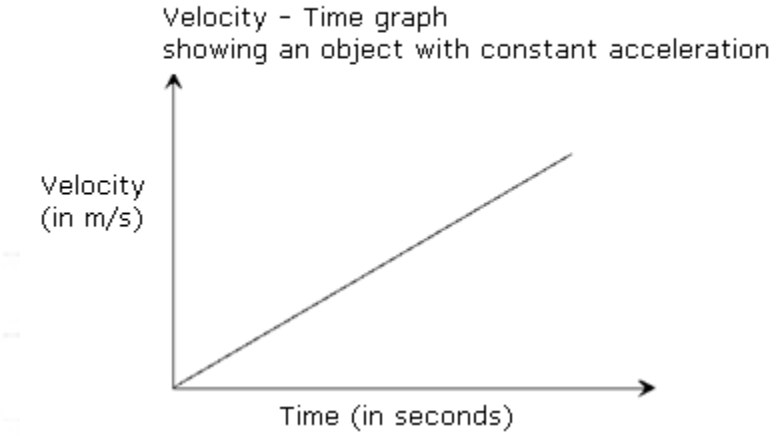
OR

(a) Force is that external agency which changes or tends to change the state of rest or of uniform motion of an object in a straight line or shape of an object. [1+1]

Newton force which produces an acceleration of 1m/s^2 in a mass of 1 kg in its

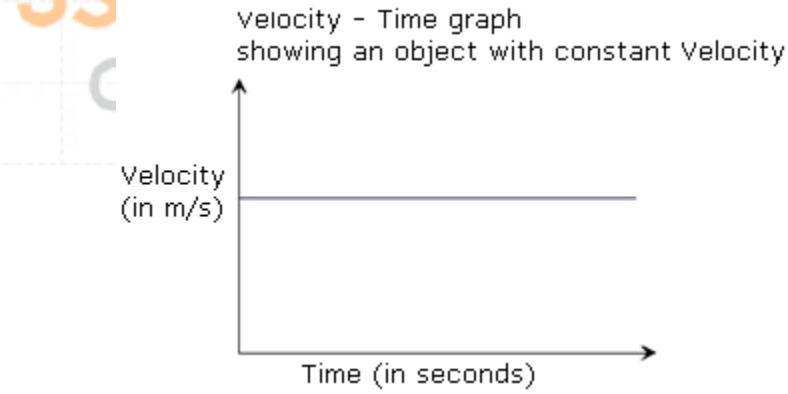
(b) (i) From O to A, as acceleration is maximum and F= ma [1+1+1]
(ii) Retardation is form B to C = 15/2 = 7.5 m/s^2
Retarding force = 7.5 m/s^2 $\times$1000 kg = 7500 N
(iii) 4 seconds from A to B

21. (a)



[1]

(b)



[1]

(c)

1. The acceleration in region C is less as compared to region A because the slope is less steep in A than in C.
2. The acceleration in C is negative because the slope is negative. That is, the body during C is retarding. The acceleration in A is positive , that is, the body is accelerating. [3]

OR

(a) Using, $a = (v-u)/t$
to see how long it takes the car to stop.
$a = -2\ m/s^2$
$v = 0$
$u = 10\ m/s$
$t = (v-u) / a$
$t = (0 - 10)/ -2$
$t = 10/ 2$
$t = 5$ seconds. [1]
The car has constant acceleration,
so the average velocity = (initial velocity + final velocity) / 2
= (10 + 0)/2
= 5 m/s. [1]
Since velocity = distance/ time
distance = velocity x time
distance = 5 x 5
= 25 m. [1]

(b)
Since the motor boat is initially at rest, u = 0 m/s [2]
Acceleration of the boat, a = 3 m /s^2
Time taken, t = 8 s

As per second equation of motion, $s = ut + \frac{1}{2}at^2$

Distance covered by the boat, $s = 0 + \frac{1}{2} \times 3 \times 8^2 = 96m$

22. (a) Homogeneous mixture: - A mixture is said to be homogeneous if the different constituents or components present in it are uniformly mixed without any clear boundary of separation. [1]
For example, sugar dissolved in water **or any other suitable example** [1/2]

Heterogeneous mixture: - A mixture is said to be homogeneous if it does not have a uniform composition and also has visible boundaries of separation between the constituents. [1]
For example, a mixture of oil and water **or any other suitable example** [1/2]

(b) Pure substances: - iron, distilled water. [1/2 X 2]
Mixture : - Milk, air [1/2 X 2]

OR

Four application of colloidal solutions are:-
(i) Bleeding from a cut can be immediately stopped by applying alum or ferric chloride
(ii) Medicines in colloidal form can be easily absorbed by the body.
(iii) Soaps clean dirty clothes due to the formation of colloidal solutions.
(iv)Delta is formed when river water comes in contact with sea water for a long period [1/2 x 4]

(b)

Physical change	Chemical change
1. It is of temporary nature.	1. It is of permanent nature.
2. Only the physical properties of substances change.	2. Both physical and chemical properties of substances change.

3. No new substance is formed in a physical change.	3. New substances are always formed in a chemical change.
4. Identities of the substances do not change.	4. Identities of the substances change.
5. Energy change normally do not occur.	5. Energy change always takes place.
6. Mass of the substance does not change.	6. Mass of the substance does change.

[1/2 x 6]

23.

Characteristics	Solid	Gas
(i) Inter particle forces of attraction.	The forces are strongest	Weakest forces between the particle
(ii) Compressibility	Almost incompressible	Highly compressible
(iii) Rigidity	Rigid in nature	Fluid
(iv) Inter particle spaces	The spaces are nearly negligible.	The spaces are very large.
(v) Kinetics energy of particles	Very less	Very high

[1 x 5]

OR

The three states of matter differ with respect to the inter particles spaces. These are minimum in the solid state while maximum in the gaseous state. [1]

(b) The wet clothes can be dried in a number of ways:-

(i) By spreading them in air under sun so that the water may evaporate. [1]

(ii) By spreading them under fan in a room. [1]

(iii) By ironing the clothes. As a result, the moisture present will escape as steam/vapours and clothes will soon become dry [1]

(c) All of them occupy space and have mass. [1]

24. (a) Temperature and photoperiods.

[½,½]

(b) The preventive and control measures should be taken before storage of grains are:

(i) Strict cleaning of the produce before storage.

[1]

(ii) Proper drying of produce first in sunlight and then in shade.

[1]

(iii) Fumigation using chemicals that can kill pests.

(Any Two points)

(c)

Manures	**Fertilizers**
(i) They are organic in nature.	(i) They are inorganic in nature.
(ii) They are difficult to store & carry.	(ii) They can be easily stored and easy to carry.

[½x4=2]

OR

(a) Berseem, oats and sudan grass.

[½,½]

(Any Two)

(b) The good management practices for the increased production of poultry birds include:

(i) Maintenanace of temperature in housing. [1]

(ii) Prevention and control of diseases and pests. [1]

(c) Biological control methods should be preferred for protecting crops because:

(i) They do not harm useful organisms. [1]

(ii) They do not cause poisoning of the stored food grains. [1]

SECTION B

25. (a) [1]

26. (b) [1]

27: (c) [1]

28: (c) [1]

29: (b) [1]

30: (d) [1]

31: (d) [1]

32: (b) [1]

33: (b) [1]

34: (c) [1]

35: (b) [1]

36: (a) [1]

37. (a) [1]

38. (c) [1]

39. (b) [1]

40. (b) [1]

41. (a) [1]