SUMMATIVE ASSESSMENT - I
SCIENCE Class - IX
Time Allowed: 3 hours Maximum Marks: 90

SECTION A

1. Breathing on a mirror turns mirror foggy, what phenomenon is responsible for this? [1]
2. What is the major function of cell wall in plant cell? [1]

3. When a carpet is beaten with a stick, dirt comes out of it. Why? [1]
4. (a) Name the two factors on which the buoyant force depends. [2]
   (b) State the relationship between the buoyant force on an object and weight of the liquid displaced by it.
5. State any two reasons for plant cells to have large central vacuole. [2]
6. List any four salient features of meristematic tissue. [2]
7. What is a super saturated solution? [2]

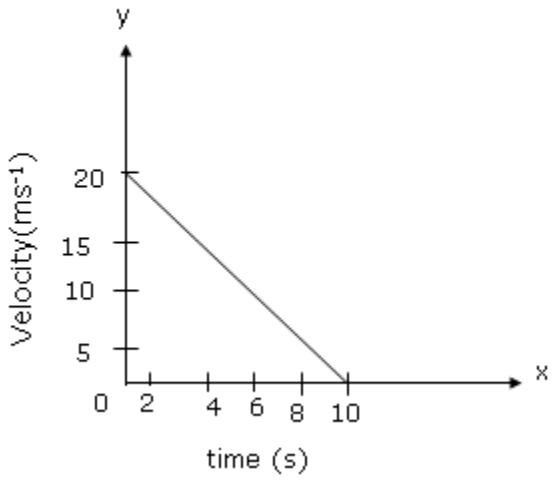
8.Give reason for the following:-
(a) A wet handkerchief is placed on the forehead of a person suffering from high fever.
(b) We often sprinkle water on the road in summer. [3]

9. (a) Write four differences between true solution and colloidal solution.
(b) What is observed when electric current is passed through a colloidal solution? [3]

10. Draw diagrams to show the difference between the structures of the three types of muscles fibres. [3]
11. (a) List any four characteristics of parenchyma tissue.
    (b) What is aerenchyma? [3]
12. Define manures. What are its three different kinds? State two limitations of manures.

13. Write any one function of the following: [3]
    (a) Lysosome
    (b) Golgi apparatus
    (c) Endoplasmic Reticulum
14. (a) What is mixed cropping? [3]
    (b) Write any two advantages of mixed cropping.

15. The velocity time graph of a ball of mass 20 g moving along a straight line on a level ground is given below. How much force does the ground exert on the ball to bring it to rest? [3]



16. (a) A car accelerates uniformly from 18 kmh^{-1} to 36 kmh^{-1} in 5s. Calculate: (i) acceleration (ii) distance covered by the car in that time. [3]
(b) The length of minute hand of a clock is 14 cm. calculate the speed with which the tip of the minute hand moves.

17. (a) Define the term inertia. Name the quantity that measures it. [2]
(b) Which physical quantity corresponds to rate of change of momentum? [1]

18. (a) Two objects of masses M1 and M2 are dropped in vacuum from a height above the surface of Earth (M1 is greater than M2). Which one will reach the ground first and why? [1]
(b) The earth attracts the moon. Does the moon attract the earth? If it does, why does the earth not move towards the moon? [2]

19. A ball thrown up vertically returns to the the thrower after 6s. Find: [3]

(a) The velocity with which it was thrown up.
(b) The maximum height it reaches.
(c) Its position after 4s. (Given g= 9.8 m/s^2)

20(a) How can a saturated solution be made unsaturated?
(b) Give any four application of centrifugation.
(c)Name the technique used to separate:-
(i) butter from curd
(ii) Salt from sea water [5]

(a) How is air separated from its constituents?
(b) How are sol, solution and suspension different from each other? [5]

21(a)why does a steam produces more severe burns on the skin as compared to boiling water?
(b)Give to reason to justify that:-
(i) Water at room temperature is a liquid.
(ii) An iron almirah is a solid at room temperature.
(c) is dry ice the same thing as ordinary ice? [5]

OR

21(a) How does water kept in an earthen pot become quite cold during summer ?
(b) Why can we sip hot tea from a saucer faster than from a cup?
(c) Why do solids not possess fluidity? [5]

22. (a) Write any two points of difference between manure and fertilizer. [5]
(b) Name two types of fertilizers.
(c) How the excessive use of fertilizers harmful?

OR

(a) Write any three criteria for the selection of crops during mixed cropping.

(b) Name any two plant micronutrients.

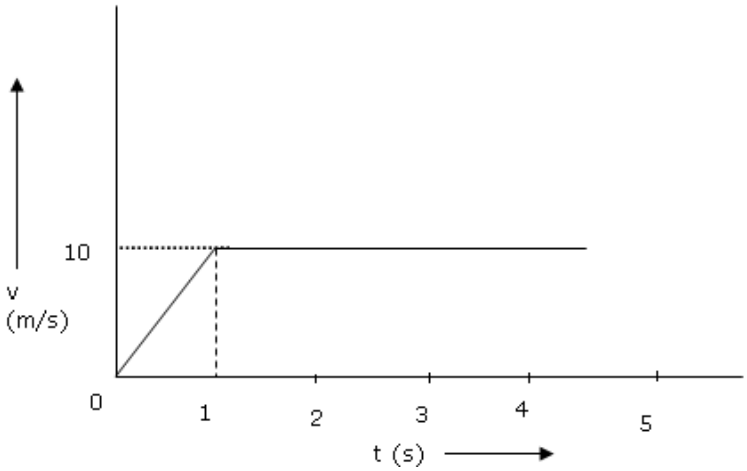
(c) What is hybridization? [5]

23. (a) If the mass of a body is doubled, what happens to its acceleration when acted upon by the same force? [5]
(b) It is easier to stop a tennis ball than a cricket ball moving with the same speed. Why?
(c) A girl of mass 40 kg jumps with a horizontal velocity of 5 ms^{-1} on to a stationary cart with frictionless wheels. The mass of the cart is 3 kg. What is her velocity as the cart starts moving?

OR

(a) What happens to a person traveling in a bus when the bus takes a sharp turn? Give reason.
(b) A cricketer moves his hands backwards on catching a fast moving ball. Why?
(c) A bullet of mass 0.02 kg is fired by a gun of mass 100 kg. If the speed of the bullet is 80 ms^{-1}. Calculate the recoil speed of the gun?

24. (a) Velocity of a particle moving along a straight line in a certain time interval is shown below. What is the distance traveled during acceleration? [1]



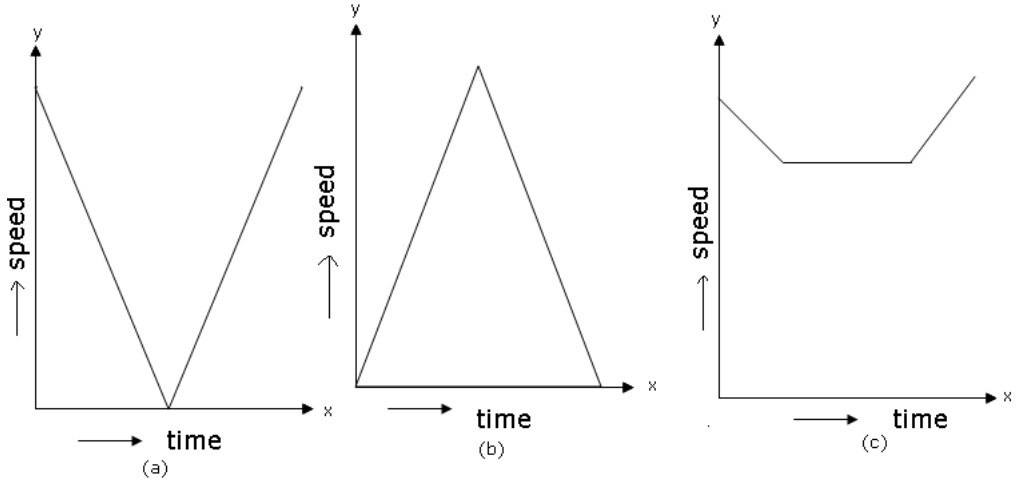
(b) A body can have zero average velocity but not zero average speed. Justify. [2]

(c) A train 100 m long is moving with a velocity of 60 kmh^{-1}. Find the time it takes to cross the bridge 1 km long. [2]

OR

(a) While driving Jayant travels 30 km with a speed of 40 km/h and next 30 km with a uniform speed of 20 km/h. Find his average speed. [3]

(b) Three speed-time graphs are shown below.



Which graph represents the case of: [2]

(i) A ball thrown vertically upwards and returning to the hand of the thrower?

(ii) A body decelerating to a constant speed and accelerating.

SECTION B

25. A student carefully observed the colloids of starch in water, human blood and cow milk .On the basis of his observations; he made certain conclusions given below. Choose the wrong conclusion for a colloid:

a) Translucent

b) Components can not be separated by ordinary filtration

c) Homogeneous

d) Stable

26. A student was asked to mix egg white in water and stir well. The student observes that

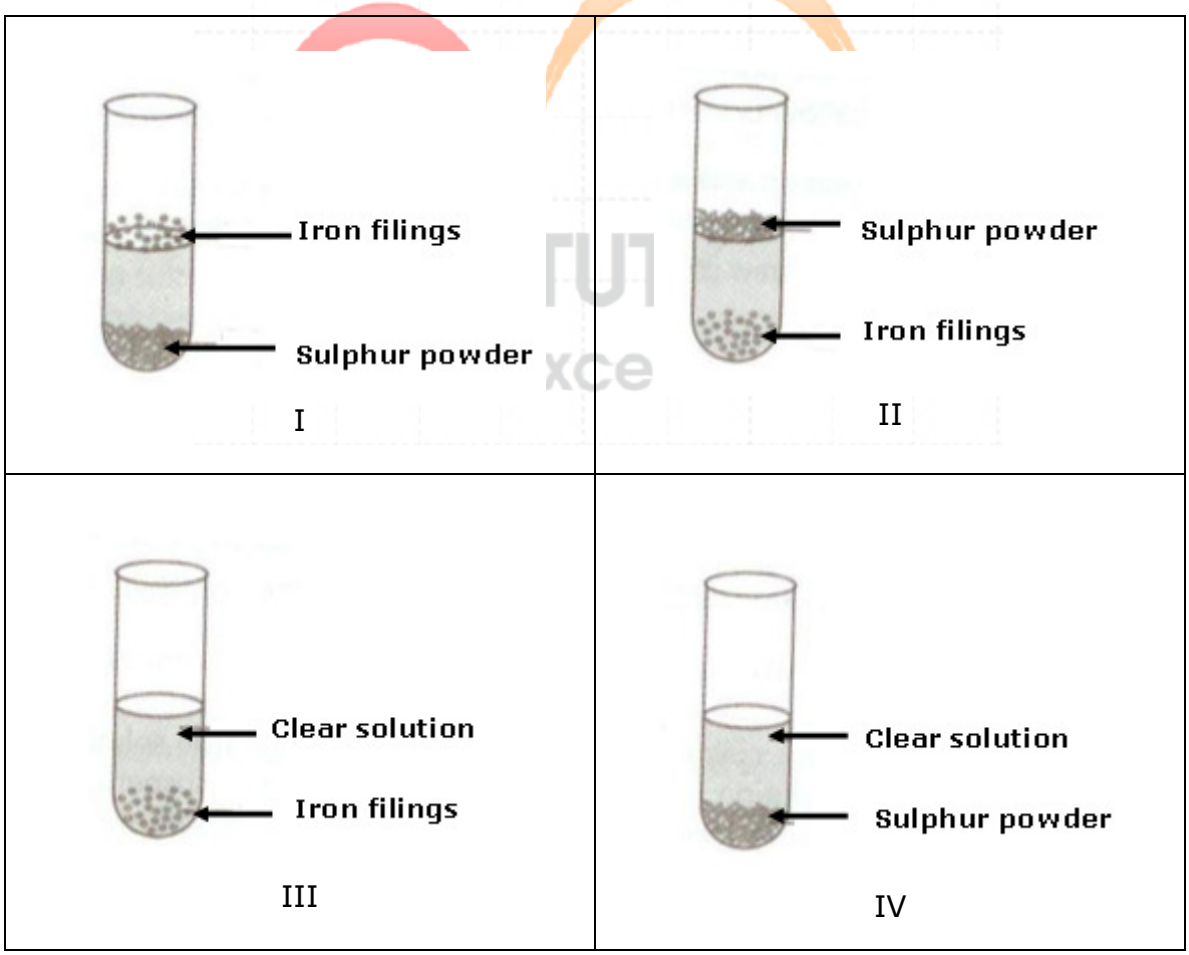
a) A transparent solution is formed

b) A translucent mixture is formed

c) Egg white settles down at bottom

d) Egg white floats on surface of water

27. In an experiment, carbon disulphide was added to test tube containing a mixture of iron filings and sulphur powder as shown in the given diagrams. Which of the following diagram represents the correct observation?



a) I

b) II
c) III
d) IV

28. Iron filings are kept in a beaker containing copper sulphate solution. The colour of the solution becomes:
a) Light green
b) Faint blue
c) Steel grey
d) Reddish brown

29. While performing the experiment a student starts heating water with a gas burner. He records reading of the thermometer after fixed interval, say after two minutes. He observes that the temperature

a) Increases regularly
b) Increases and then decreases rapidly
c) Increases slowly, then decreases slowly and then becomes constant
d) Increases gradually and then becomes constant

30. While determining the melting point of ice under standard conditions following temperatures were recorded by four students A, B, C and D respectively.

Name of student	Temperature
A	$1^{o}C$
B	$0.2^{o}C$
C	$-0.2^{o}C$
D	$0^{o}C$

Which student recorded the melting point of ice correctly?
a) Student A
b) Student B
c) Student C
d) Student D

31.State of matter can be changed by changing:
a)Temperature
b)Pressure
c)Both temperature and pressure
d) None of these

32. Four students A, B, C and D studied the properties of a mixture of sulphur powder and iron filings. They recorded their observation in the table mentioned below. Find the student with correct result?

Properties	Appearance		Behaviour towards magnet		Behaviour towards CS_2		Effect of heat	
Student	Homogeneous	Heterogeneous	Attracted	Not attracted	One part dissolved	Nothing dissolved	Mixture glow	No effect
A	×	✓	✓	×	✓	×	✓	×
B	×	✓	✓	×	×	✓	×	✓
C	✓	×	×	✓	✓	×	✓	×
D	×	✓	×	✓	✓	×	×	✓

a) Student A
b) Student B
c) Student C
d) Student D

33. The physical properties shown by the gas that is formed by the reaction between zinc and sulphuric acid are:
a) Odourless and colourless
b) Blue colour with pungent smell
c) Green colour and odourless
d) Colourless and rotten egg smell

34. When a mixture of iron and sulphur is heated strongly chemical reactions takes place leading to the formation of compound iron sulphide (FeS). This compound is allowed to cool. Compound is grounded in a mortar with help of a pestle to form a fine powder. A piece of magnet is repeatedly rolled over the fine powder. What is the observation?
a) Only iron particles are attracted towards magnet
b) Only sulphur particles are attracted towards magnet
c) Iron sulphide particles are attracted towards magnet
d) None of the particles are attracted towards magnet

35.The thread used in the spring balances experiment is extensible. The proabable error that can result due to this property of the thread is
(a) the readings of the two spring balances will be different
(b) one of the spring balance could read zero
(c) the force experienced by each of the spring balances could be different from what is externally applied

36. In the spring balances experiment, the total force which pulls each of the springs should
(a) The weight of the pan
(b) The weight of the pan and the weights put in the pan

(C) the weights put in the pan only

37. For observing plant tissues the stain generally used is: [1]
    (a) Methylene blue
    (b) Safanin
    (c) Phenolphthalein
    (d) Glycerin

38. The organelle not observed in animal cell is:
    [1]
    (a) Nucleus (b) Cytoplasm
    (c) Chloroplast (d) Plasma membrane

39. Cells of a tissue in the mounted slide were observed to have central vacuole and irregularly thickened at corners. The given tissue is:
    [1]
    (a) parenchyma (b) sclerenchyma
    (c) xylem (d) collenchyma

40. Why should we put coverslip very carefully on a material which is to be mounted?

    [1]
    (a) to avoid drying of the material.
    (b) to avoid folding of the material.
    (c) to avoid air bubbles.
    (c) to increase visibility.

    [1]

41. The solution used to test the presence of starch is:

    (a) Methylene blue
    (b) Iodine
    (c) Safranin
    (d) Conc. HCl [1]

42. The reagent used to test the presence of metanil yellow in dal is:
    (a) HNO_3

    (b) Iodine solution

    (c) HCl

    (d) Safranin [1]

Solution

SECTION A

1. Condensation [1]

2. The Major function of cell wall is to provide protection and strength to the cell. [1]

3. When a carpet is beaten with a stick, it comes in motion. The dust particles in the carpet tend to remain at rest due to inertia of rest. [1]

4. (a) (i) Volume of the object immersed. [½]
(ii) Density of the fluid. [½]
(b) Buoyant force on an object= Weight of the liquid displaced by the object [1]

5. (i) Vacuoles help in maintaining the osmotic pressure of the cell. [1]

(ii) They store important substances like amino acids and some proteins. They also store metabolic wastes of the cell. [1]

6. (a) Cells divide repeatedly
(b) Cell walls are thin
(c) Vacuoles are not found
(d) Metabolically very active
(e) Have dense cytoplasm
(f) Have prominent nucleus (any Four) [½x4]

7. A solution which contains a greater amount of solute that is required to form a saturated solution is known as supersaturated solution. [2]

8(a) As the water from the wet cloth evaporates; it takes heat from the skull and the brain within it. This, inturn, lowers the temperature of the brain and protects it from any damage due to high temperature. [2]
(b) The water evaporates rapidly from the hot surface of the road, thereby taking heat away from it. Thus, the road becomes cool. [1]

9 (a)

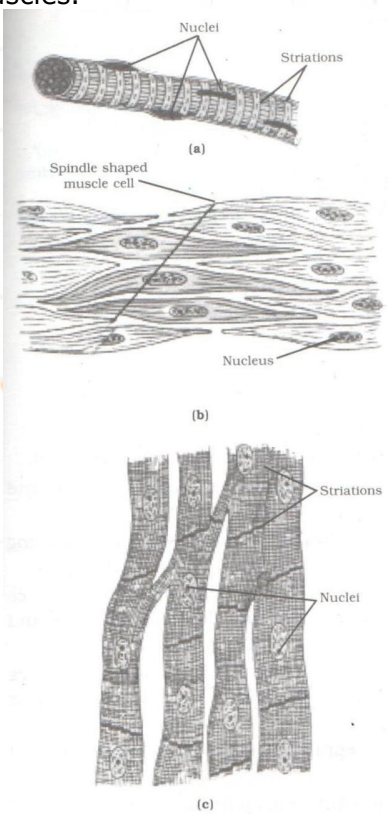
True solution	Colloidal solution
1. The particle size is less than 10^{-8}	1. The particle size is in between 10^{-7}

cm.	cm to 10^{-5} cm.
2. The particles of a true solution do not scatter light.	2. The particles of a true solution scatter light.
3. True solution is clear and transparent.	3. Colloidal solution is translucent.
4. True solution is homogeneous.	4. Colloidal solution is heterogeneous.

[1/2 X 4]

(b).When electric current is passed through a colloidal solution, the colloidal particles start moving towards oppositely charged electrode i.e. electrophoresis takes place. [1]

10. Three types of muscle fibres are-
(a) striated muscles
(b) unstriated muscles
(c) cardiac muscles.



[3]

11. (a) Characteristics of Parenchyma tissues:
(i) Its cells are living.
(ii) Intercellular spaces are present.
(iii)The cell wall is thin formed of cellulose.
(iv) A large vacuole is present in the centre of the cell.
(v) Cells are generally rounded oval or polygonal.
(Any four points) [½x4]
(b) In aquatic plants, large air cavities are present in parenchyma to give buoyancy to the plants to help them float. Such type of parenchyma is called

aerenchyma. [1]

12. (a) Manures are natural fertilizers, which contain organic matter and prepared by decomposed animal waste and vegetative waste. [½]

(b) **Types of manure**

(i) Compost (ii) Vermicompost
(iii) Green manure [1½]

(c) Limitations of manures:

(i) Manure is not a nutrient specific. [½]
(ii) It supplies small quantities of nutrients to the soil. [½]

13. (a) Lysosome – It removes old and worn out organelles from the cell. [1]
(b) Golgi apparatus – It packages materials synthesized in the cell and transports them outside the cell. [1]
(c) Endoplasmic Reticulum – It serve as a channel for the transport of material between the nucleus & cytoplasm. [1]

14. (a) Mixed cropping is the technique of growing two or more different crops together in the same field. [1]

(b) Advantages of mixed cropping:
(i) No risk of complete crop failure. [1]
(ii) Growth of leguminous reduces the requirements of fertilizers. [1]

15. $F = ma = \frac{m(v-u)}{t}$ [1]

$F = \frac{20\times10^{-3}\,kg\,(0-0.2)\,ms^{-1}}{10\,s}$ [1]

$= -4\times10^{-4}\,N$ [1]

16. (a) u= 18 km/h = 5 m/s
V= 36 km/h = 10 m/s
t= 5s

$a = \frac{v-u}{t} = \frac{(10-5)\,ms^{-1}}{5s} = 1ms^{-2}$ [1]

$S = ut + \frac{1}{2}at^2$

$= 5\times5 + \frac{1}{2}\times1\times5^2 = 37.5m$ [1]

(b)

$v = \frac{2\pi r}{t} = 2\times\frac{22}{7}\times\frac{14}{60\times60}$

$= \frac{11}{450}\,cm/s$ [1]

17. (a) Inertia is the tendency of a body to remain in its state of rest or of uniform motion in a straight line. [1]
Mass gives the measure of inertia. [1]

(b) Force [1]

18. (a) Both will reach the earth simultaneously, as acceleration due to gravity is independent of the mass of the object. [½+½=1]
(b) 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 produced in the earth is negligible. [1]

19. time of ascent= time of descent=t= $\frac{6}{2} = 3\,s$

(a) u=?; v= 0, a= -g= -9.8 ms^{-2}

V= u+at

$0 = u - (9.8) \times 3$

$u = 29.4\,ms^{-1}$ [1]

(b) $v^2-u^2=2as$

$0-(29.4)^2= +2\ (-9.8)h$

h= 44.1 m [1]

(c) After 4s, downward journey for 1s has been covered

$h= ut+½at^2$

$= 0+1/2\ (9.8)\times 1^2= 4.9$ m [1]

20. (a) A saturated solution be made unsaturated in two ways:-
(i) By increasing the temperature
(ii) By adding more solvent to the solution [1/2 x 2]

(b) Four application of centrifugation are:-
(i) It is used in daries and home to separate cream from milk or butter from cream.
(ii) It is used in washing machine to squeeze out water from clothes.
(iii) It is used in laboratories to separate colloidal particles from their solutions.
(iv) It is used in diagnostic labs for blood and urine test. [1/2 x 4]

(c)(i) Centrifugation [1]
(ii) Either by crystallization or by evaporation [1]

OR

20. (a) Air is a homogenous mixture of several gases which have boiling points much below room temperature. Air is first of all brought to liquid form under higher pressure and reduced temperature. Then at constant high pressure, it is slowly warmed up in fractionating column .Different fractions of air then obtained in gaseous form at different temperature at different heights. [2]

(b)

Property	True solution	Colloidal solution	Suspension
Filteration	Pass through ordinary filter paper	Pass through ordinary filter paper	Does not pass through ordinary filter paper

Nature	Homogeneous	Heterogeneous	Heterogeneous
Visibility	Solute particles are not visible even under a microscope	Particles themselves are invisible but their presence can be detected under a ultramicroscope.	Particles are generally visible to the naked eye.

[1 x 3]

21.(a) Steam is formed when water at its boiling point of 373 K absorbs latent heat of vaporization. Therefore, steam has more energy than water. On account of this, steam produced more severe burns on skin as compared to boiling water. [2]

(b) (i) Water at room temperature is a liquid due to the following reasons:-
1). It has a fixed volume.
2). It can take the shape of any container in which it is placed. [1/2 x2]

(ii)An iron almirah is a solid due to the following reasons:-
1).Its shape does not change when pressed,i.e. it is hard and rigid.
2).It has a fixed volume. [1/2 x2]

(c) No, dry ice is solid carbon dioxide while ordinary ice is solid water. [1]

OR

21 (a) The earthen pot is full of small pores. Water present in these pores has a tendency to evaporate at a fast rate during summer. [1]
Since cooling is caused in evaporation, the temperature of the water inside the earthen pot gets considerably lowered and it becomes cold. [1]

(b) The surface area of the cup is smaller than the saucer. Therefore, evaporation occurs slowly and hence the tea in the cup remains hot for a sufficient long time. Therefore, we can sip hot tea from a saucer faster than from a cup. [1]

(c) The constituents in the solids are very closely packed and interparticle forces are quite strong. Therefore, solids have hardly any fluidity. [2]

22. (a)

Manure	Fertilizer
(i) Manure is semi- decomposed organic matter.	(i) Fertilizer is chemical in nature.
(ii) It is not nutrient specific.	(ii) It is nutrient specific.

[2]

(b) (i) Nitrogenous fertilizers [½]

(ii) Phosphatic fertilizers [½]

(c) Fertilizers are non- biodegradable. The excessive use of fertilizers leads to water pollution in lakes and rivers due to eutrophication. It also changes the soil texture by making it either too acidic or too alkaline. [2]

OR

(a) Criteria for selection of crops:

(i) Root patterns: Both the crops should not have same root patterns. One crop should have deep penetrating roots whereas the other crop should have shallow roots. [1]

(ii) Water Requirements: Both the crops should have different water requirements. If one of the crops requires higher amount water, the other should require lesser amount. [1]

(iii) Nutrient Demand: If one of the crop requires higher amount of nutrition, the other crop should require lesser amount of nutrition. [1]

(b) Iron, Zinc or copper. [1]
(Any Two)

(c) Crossing between genetically dissimilar plants is called hybridization. [1]

23. (a) $F = ma \Rightarrow a = f/m$
Acceleration becomes half [1]

(b) Mass of tennis ball is less than mass of cricket ball
$\therefore$ mv of tennis ball is less than mv of cricket ball [1]

(c) Assume that there is no external force working in the horizontal direction
$(m_1+m_2)\ v = m_1u_1+m_2u_2$ [1]

$(40+3)v = 40\times 5+0 = 200$ [1]

$v = \frac{200}{43} = 4.65\,ms^{-1}$ [1]

OR

(a) Person traveling in the bus tends to be thrown outwards due to inertia of direction of passenger [1½]

(b) As the time of catch increases, the force due to impact decreases because rate of change in momentum decreases [1½]

(c) mv+ Mv= 0 [1]

$$v = \frac{-mv}{M} = \frac{-0.02 \times 80}{100} = 0.016\,ms^{-1}$$ [1]

24. (a) Distance = area under v-t graph = 10 m/s x 1s = 10 m [1]

(b) $A_v = \frac{\text{total displacement}}{\text{total time taken}}$ [½]

$A_S = \frac{\text{total distance travelled}}{\text{total time taken}}$ [½]

Total displacement may be zero but not total distance traveled [1]

(c) Total distance to be traveled= 100+1000= 1100m [1]

$V = 60\,kmh^{-1} = \frac{50}{3}\,ms^{-1}$

$\text{time taken} = \frac{1100}{50/3} = 66s$ [1]

OR

(a) For first 30 km:
Distance= 30 km
Speed= 40 km/h
Time (t_1) = 30/40 = ¾ h
For next 30 km:
Distance= 30 km [1]
Speed= 20 km/h
Time (t_2) = 30/20 h = 3/2 h
Average speed= total distance/total time [1]
= (30+30)/ (3/4+3/2)
= 80/3
= 26.67 km/h (approx.) [1]

(b) (i) Graph (a) represents the case of a ball thrown vertically upwards and returning to the hand of the thrower. [1]
At t= 0, speed is maximum. The speed decreases as a constant rate, becomes zero at maximum height. The ball then falls with a uniform acceleration.
(ii) Graph (c) represents deceleration of the body to same constant speed and then accelerating after some time. [1]

SECTION B

25. (c)

26. (b)

27. (c)

28. (a)

29. (d)

30. (d)

31. (c)

32. (a)

33. (a)
34. (d)

35. (c)
36. (b)

37. (b) [1]
38. (c) [1]
39. (d) [1]
40. (c) [1]
41. (b) [1]
42. (c) [1]