Class IX
Term I
Summative assessment I
Sample paper 2

SECTION A

1. Define 1 kg weight and express it in Newton. [1]

2. What is plasmolysis? [1]

3. What produces more severe burns, boiling water or steam? [1]

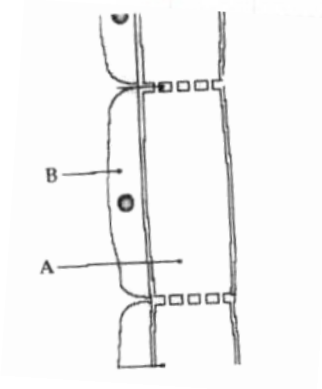
4. The earth attracts an apple. Does the apple also attract the earth? If it does, why does the earth not move towards the apple? [2]

5. Define a mixture? Name two types of mixtures. [2]

6. (a) Expand DNA? [2]

(b) In which part of a cell it is found? State its function.

7. (a) Identify the type of plant tissue given below. Where in the stem of a plant would you find this tissue?




(b) Label the parts marked 'A' and 'B'. [2]

8. (a) Give four differences between boiling and evaporation?
(b) Arrange solids, liquids and gases in order of:
(i) Increasing intermolecular spaces
(ii) Increasing intermolecular forces [3]

9. (a) Which separation technique will be used for the separation of the following?
(i) Sodium chloride from its solution in water.

(ii) Iron pins from sand
(b) Which technique is used to separate cream from milk? [3]

10. When are the forces acting on a body said to be balanced? Give an example. What type of change can the balanced forces bring about in an object? [3]

11. Derive an expression for acceleration due to gravity on a planet of mass M and radius R. [3]

12. Define momentum. [3]
Which is having a higher value of momentum-A bullet of mass 10 g moving with a velocity of 400m/s or a cricket ball of mass 400g thrown with the speed of 90 km/hr?

13. A ball is gently dropped from a height of 20 m. If its velocity increases uniformly at the rate of $10m/s^2$, with what velocity will it strike the ground? After what time will it strike the ground? [3]

14. A ball thrown up vertically returns to 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. (Take g= 10 $m/s^2$)

15. How is green manure prepared? When is it added to the crop plants? What is the advantage of this type of manure? [3]

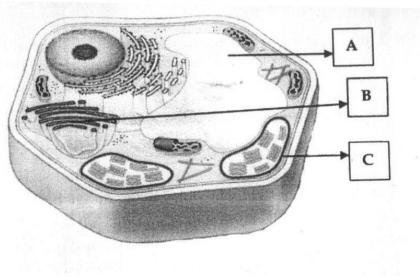
16. List six facilities that must be provided to cattle to ensure their good health and production of clean milk? [3]

17. (a) Draw a labeled diagram of a neuron. (Three labellings) [3]

(b) Identify the tissue which is made up of these cells.

(c) Name one organ that is made of this tissue.

18. (a) In the diagram given below identify the part marked B and C




(b) What are the substances that organelle A stores?

(c ) What are cisterns?

19. (a) Which substance present in the cell walls of collenchyma that makes it strong and flexible?

(b) Where is apical and lateral meristerms located? Write one function of each. [3]

20 (a) A solution contains 40 g of common salt in 320 g of water. Calculate the concentration in terms of mass by mass percentage of the solution.
(b) Classify the following into elements, compounds and mixtures: coal, methane, graphite and sugar.
(c) Define gels ? [5]

**OR**

20. (a) Write any four application of paper chromatography.
(b)How much water should be added to 50 g of glucose, so as to obtain 12 % glucose solution ?
(c) Define Tyndall effect. [5]

21 (a).Give reasons:
(i) A gas exerts pressure on the walls of the container.
(ii) Ice floats on water.
(b) For any substance, why does the temperature remains constant during the change of state?
(c) What is the effect of following factors on evaporation:-
(i) Surface area
(ii) Temperature [5]

**OR**

21.(a) Define latent heat of fusion.
(b) How the melting points of the solids affected by the pressure.
(c) Why should we wear cotton clothes in summer? [5]

22. (a) What is animal husbandry?

(b) Why is cattle farming done?

(c) What are the two types of food requirement of dairy animals? [5]

**OR**

(a) What are the different modes of attack of insect pests.

(b) Give any two examples of insect pests.

(c) Name and list examples of the factors responsible for losses during storage of grains. [5]

23. State and verify law of conservation of momentum. [5]

**OR**

(a) State second law of motion. Give its mathematical expression.
(b) How will you define unit of force using this law?
(c) Calculate the mass of a body when a force of 525 N produces an acceleration of 3.5 $m/s^2$.

24. (a) Name the quantity measured by the area occupied below the velocity-time graph. [1]

(b) Distinguish between uniform and non-uniform motion. [2]

(c) A body is moving along a circular path of radius R. what will be the [2] distance and displacement of the body when it completes half a revolution?

**OR**

1. A body starts from rest. What is zero? [1]

2. a person traveling in a bus noted the timings and the corresponding [2] distances as indicated on the km stones.

| **Time** | **Distance** |
|---|---|
| 8.00 am | 10 km |
| 8.15 am | 20 km |
| 8.30 am | 30 km |
| 8.45 am | 40 km |
| 9.00 am | 50 km |

(a) Name this type of table.

(b) What conclusion do you draw from this data?

3. (a) what is acceleration? Write its unit. [2]

(b) Draw velocity-time graph, when an object has

(i) uniformly accelerated velocity

(ii) uniformly related velocity



**SECTION B**

Q25. Milk is an example of:

a) Colloid

b) True solution

c) Suspension

d) Pure Substance

Q26. To prepare a colloid of starch in water, we should:

a) Add starch powder to boiling water and then cool

b) Add starch powder to cold water and boil

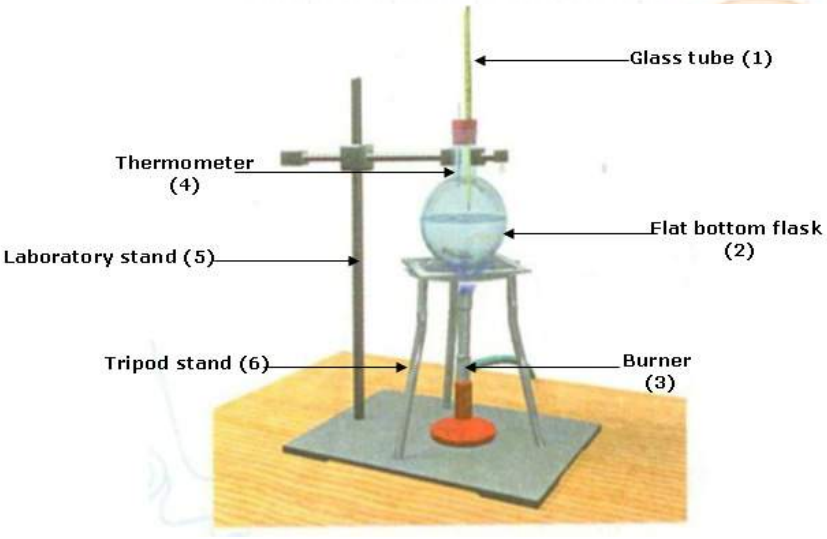
c) Heat starch powder and add it to cold water then bring it to boil

d) Add thin paste of starch to hot water with constant stirring

Q27 For preparing iron sulphide (FeS) by heating a mixture of iron filings and sulphur powder, we should prefer to use
a) Copper dish
b) Watch glass
c) China dish
d) Petri dish

Q28. Hydrogen gas is liberated when zinc reacts with sulphuric acid. The gas is tested by:
a) Lime water which turns milky
b) Red litmus paper which turns blue
c) Blue litmus paper which turns red
d) A glowing splinter which burns with a pop sound

Q29. Below mentioned is the set up for the experiment to determine the boiling point of water.




Name the apparatus that are labeled incorrectly.
a) (1), (2) and (3)
b) (1), (3) and (5)
c) (4), (5) and (6)
d) (4), (2) and (1)

Q30. Which of the following statements is incorrect for the experiment while measuring the boiling point of a liquid?
a) The bulb of the thermometer should be kept about 4 – 5 cm above the surface of the liquid.

b) Heating of the water in the round bottom flask should be done by keeping the burner constant at one place.
c) Pieces of pumice stones should be added to water before heating
d) Note the temperature by keeping you eye in line with the level of mercury

Q31. When a solution mixture of sand and salt is filtered, the residue component is:
a) Sand
b) Salt
c) Both
d) No residue

Q32. A black mass is obtained on strongly heating a mixture of iron filing and sulphur powder. When this black mass was treated with dilute hydrochloric acid a gas with smell like rotten eggs is liberated. The gas is
a) Sulphur dioxide
b) Sulphur trioxide
c) A mixture of sulphur dioxide & sulphur trioxide
d) Hydrogen sulphide

Q33. The reaction between the solutions of sodium sulphate and barium chloride is:
a) Decomposition reaction
b) Combination reaction
c) Double displacement reaction
d) Displacement reaction



Q34. A small amount of finely powdered mixture of iron and sulphur is spread on a white sheet of paper. It is then observed through a magnifying glass. Appearance of mixture is:
a) Grey and yellow particles of mixture are distinctly visible and spread uniformly
b) Grey and yellow particles in the mixture are distinctly visible, but are not spread uniformly
c) Grey particles of the mixture are not distinctly visible
d) Yellow particles of the mixture are not distinctly visible

35.In the spring balances experiment, can the action and reaction forces be interchangeable on the two springs?
(a) Yes
(b) No
(c) Depends on amount of force applied.

36.One of the two spring balances has its pointer at 1st division, before being put to use in the experiment. If each division of the spring balance implies a weight of 10 gwt., what is the correction that needs to be applied to the reading of the erronous spring balance?

(a) 10 gwt.
(b) 20 gwt.
(c) 0 gwt.
(d) 1 gwt.

37. Arun, Deepa, Uma and Priya were asked to select a plant material which would not give blue black colour with iodine solution. Who did not select the right material? [1]

(a) Arun selected maize grains.

(b) Deepa selected wheat grains.

(c) Uma selected ground nut seeds.

(d) Priya selected potato.

38. Deepak washed a few grains of tur dal in water. The water became yellow. He then added a few drops of HCL to the same test tube, the water turned pink in colour. From the above test Deepak concluded that tur dal contains. [1]

(a) Proteins

(b) Starch

(c) Turmeric

(d) Metanil yellow

39. The outer most layer in a cheek cell is the: [1]

(a) Cell wall

(b) Cell membrane

(c) Cellulose

(d) Protoplasm

40. To prepare a temporary mount of the cheek cells: [1]

(a) Scraping are taken from outer surface of the cheek

(b) Scraping are taken from the inner surface of the cheek

(c) Sediments are collected from a beaker after gargling

(d) A mucous from the throat region is used

41. Which brings message to the cell body of neuron? [1]

(a) Axon

(b) Dendron

(c) Nucleus

(d) Nissl's granules

42. The following is a typical identifying feature of sclerenchyma. [1]

(a) Sufficient inter cellular spaces

(b) Thick cell wall

(c) Storage of food

(d) Presence of chlorophyll

CBSE
Class IX
Term I
Summative assessment I
Solutions to Sample paper 2

SECTION A

1. The gravitational force of earth that acts on an object of mass 1 kg.
$w = m \times g = 1 \times 9.8\ m/s^2 = 9.8\ N$
[½+½]

2. Shrinkage of the contents of the cell and contraction of the cell membrane inwards due to loss of water, when it is placed in concentrated solution is called plasmolysis.
[1]

3. Steam produces more severe burns. [1]

4. Yes, the apple also attracts the earth towards it with equal force.
[1]
a= F/m, due to huge mass of earth, the acceleration produce in earth is negligible [1]

5. A mixture consists of two or more substances mixed together in any proportion. [1]
Depending upon the nature of the components that form a mixture we have two
types of mixtures:
(a) Homogeneous mixture [1/2]
(b) Heterogeneous mixture
[1/2]

6. (a) Deoxyribonucleic acid. [1]

(b) It is found in the chromatin material and carries hereditary information. [½+½]

7. (a) phloem; in the vascular bundle [½+½]
(b) A-sieve tube B-companion cell [1]

8.(a)

| Evaporation | Boiling |
|---|---|
| 1. Evaporation is the process of | 1. Boiling is the process of conversion |

| | |
|---|---|
| conversion of liquid to vapour which occur at much slower rate. | of liquid to vapour which occur at much faster rate. |
| 2. It takes place at all temperature. | 2. It takes place at a fixed temperature. |
| 3. It takes place only from the surface of the liquid. | 3. It takes place from all parts of the liquid. |
| 4. The rate of evaporation depends on many factors such as surface area temperature and humidity. | 4. The rate of boiling has little effect of such factors .It is affected by atmospheric pressure. |

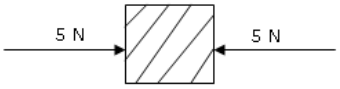
[½ x4] = 2 marks

(b) (i) Solids <Liquids < Gases [1/2]
(ii) Gases < Liquids < Solids [1/2]

Ans 9(a) (i) Evaporation [1]
(ii) Magnetic separation [1]
(b) Centrifugation [1]

10.

- When sum of all the forces acting on a body is zero. [1]
- e.g. Two boys exerting equal force on opposite sides of a box. [1]




- Balanced forces can change the shape of an object [1]

11. For an object of mass m [1]

F= mg (II Law) …(1)
From Newtons Law of Gravitation
[1]

$$F= \frac{GmM}{R^2} \quad ....(2)$$

(Where M is mass of earth and R is radius of earth)
From (1) and (2)

$$mg = \frac{GmM}{R^2}$$

[1]

$$g = \frac{GM}{R^2}$$

12. Momentum, p of an object is defined as the product of its mass, m and velocity, v. i.e, p= mv
[1]

Bullet-> mass= 10g= $\frac{10}{1000}\text{kg} = 0.01\text{kg}$

Velocity= 400m/s

Momentum= $m \times v = .01 \times 400 = 4.00\text{kg m/s}$

Cricket ball= 400g= 0.4 kg

Velocity= 90 km/hr= $\frac{90 \times 5}{18}\text{m/s} = \frac{90 \times 1000}{60 \times 60}\text{m/s} = 25\text{m/s}$ [1]

Momentum= $0.4 \times 25 = 100$ kg m/s.

$\therefore$ Cricket ball has higher momentum than Bullet
[1]

13. u= 0, s= 20m, a= 10m/s$^2$

$v^2 - u^2 = 2as$

$v^2 = 2 \times 10 \times 20$ [1½]

$\therefore v = 20\,\text{m/s}$

$v = u + at$

$20 = 0 + 10 \times t$ [1½]

$\therefore t = 2\text{s}$

14. (a) time taken to go up= 6/2= 3s
u= not given, v= 0, a= -10m/s$^2$, t= 3s

$v = u + gt$

$0 = u - 10 \times 3$ [1]

$u = 30\text{m/s}$

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

$0 - (30)^2 = -2 \times 10 \times h$

$h = 900/20 = 45\text{m}$ [1]

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

$u = 0, t = 1\text{s}, g = 10\text{m/s}^2$

$s = ut + 1/2\,gt^2$

$= 0 + 1/2 \times 10 \times 1 = 5\text{m}(5\text{m from top})$

15. (a) Plants like sun hemp are grown and mulched by ploughing them into the soil.
[1]

(b) It is added before sowing the crop seeds. [1]

(c) Helps in enriching the soil with nitrogen and phosphorous. [1]

16. (i) Regular grooming to remove dirt and hair. [½]

(ii) Well ventilated roofed sheds to protect the animals from harsh weather [½]

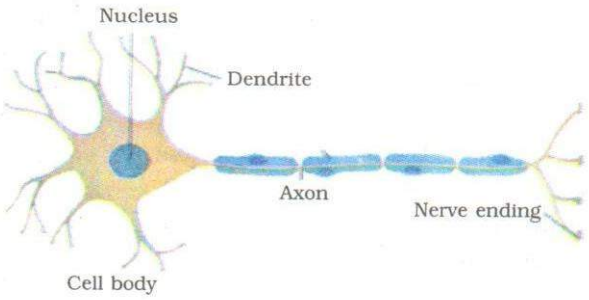
(iii) Shed with sloping floor to facilitate easy cleaning [½]

(iv) Food contaning roughage and concentrates and [½]

(v) Vaccinations from bacterial and viral diseases. [½]

(vi) Clean drinking water. [½]

17. (a) Diagram of neuron:




(Any three labellings) [2]

(b) Nervous tissue [½]

(c) Brain/ spinal cord [½]



18. (a) A-Vacuole, B-Golgi apparatus, C-plastid/chloroplast [½+½]

(b) Amino acids, proteins, sugar and organic acid. (any two) [1]

(c) Membrane bound vesicles arranged parallel to each other. [1]

19. (a) pectin [1]

(b) [½x4]

| | **Apical Meristerms** | **Lateral meristerms** |
|---|---|---|
| (a) Location | Located at the tip. | Present on the sides |
| (b) Function | Increase length of the | Increase width or |

| | | |
|---|---|---|
| | plant body | girth of the organs. |

20. (a) Mass of common salt (solute) = 40 g
Mass of water (solvent) =320 g
Therefore mass of solution = mass of solute + mass of solvent
= (40 +320) g =360 g [1/2]
Mass percentage of solution = (mass of solute/mass of solution) x 100
[1/2]
= (40/ 360) x100
= 11.1 % [1]
(b) Elements: Graphite [1/2]
Compounds: Methane and sugar [ 1 ]
Mixture: Coal [1/2]
(c) Gel is a colloidal system where the dispersed phase is liquid and dispersed medium is solid. [1]

OR

20. (a) Four application of paper chromatography are :-
(i) It is used to separate colours from a dye.
(ii) It is used in the separation of amino acids.
(iii) It is used in the separation of sugar from urine.
(iv) It is used in the separation of drugs from the samples of blood. [1/2 x4]
(b)Mass of glucose (solute) =50 g
Concentration of glucose solution = (Mass of solute / mass of solution) x 100
[1/2]
Therefore mass of solution = 50 x 100 /12
= 416.67 g [1]
Mass of water which should be added to glucose = (416.67 -50) = 366.67 g
[1/2]
(c) The phenomenon due to which the path of light becomes visible, due to scattering of light by colloidal particles is called Tyndall effect.
[1]

21 (a)
(i) When the molecule of a gas which have high kinetics energy strike against the walls of container, they exert some force per unit area i.e. pressure. Therefore, a gas exerts pressure on the walls of the container.
[1]
(ii) Water expands on freezing and this leads to decrease in density. Thus being lighter ice floats on water. [1]

(b) During the change of state, heat is absorbed but this heat used up in changing the state by overcoming the forces of attraction between the particles. Thus, there is no change in temperature although heat is being absorbed constantly. [1]

(c) (i) Evaporation increases with increase in the surface area of the liquid.More is the surface area of a liquid, more is the rate of evaporation. [1]

(ii) Evaporation increases with increase in the temperature of the liquid.More is the temperature of liquid, more is the rate of evaporation. [1]

OR

21 (a) The amount of heat energy that is needed to convert one kg of a solid into the liquid state without any rise in temperature is called as latent heat of fusion. [1]

(b) The temperature remains constant during melting.The melting point of solids,which expand on melting, increases with rise of pressure while the melting point of solids,which contract on melting, decreases with rise of pressure. [2]

(c) The cotton clothes are very good absorbers of water. They rapidly absorb the sweat from our skin. The sweat then evaporates taking large amount of heat from our body,thereby giving a cool sensation. Due to this reason we wear cotton clothes in summer.
[2]

22. (a) Animal husbandry is the scientific management of animal liverlock.
[1]

(b) Cattle farming is done for two purposes:

(i) Milk- The milk producing animals are called diary animals or milch
[1]

Animals.

(ii) Draught labour- Animals used as farm labour for tilling, irrigation & casting are called draught animals.
[1]

(c) Food requirements of dairy animals are of two types:

(i) Maintenance requirement, which is the food required to support the animal live a healthy life.
[1]

(ii) Milk producing requirement, which is the type of food required during the lactation period.
[1]

OR

(a) Modes of attack of insect pests:

(i) Cutting & chewing-insects cut & chew roots, stems and leavers of the plants.
[1]

(ii) Sucking- insects suck the cell rap from different parts of the plants
[1]

(iii) Baring- bores insects bore and enter different plant parts and feed on the plant tissues. (any two)

(b) Aphids, locusts and grasshoppers. (any two)
[1]

(c) Two types of factors responsible for losses during storage of grains are:

(i) Biotic factors such as insects, rodents, miles and bacteria
[1]

(ii) Abiotic factors such as moisture content temperature & humidity.
[1]

Total momentum of a system remains conserved provided no external force acts on the system.
[1]

23. Mathematical verification of $m_1u_1+m_2u_2= m_1v_1+m_2v_2$ :

Let us consider 2 balls having masses $m_1$ and $m_2$ respectively. Let the initial velocity of ball A be $u_1$ and that of ball B be $u_2$ ($u_1>u_2$). Their collision takes place for a very short interval of time t and after that A and B start moving with velocities $v_1$ and $v_2$ ($v_1<v_2$). [1]

The momentum of ball A before and after the collision is $m_1u_1$ and $m_1v_1$ respectively. If there are no external forces acting on the body then the rate of change of momentum of ball A, during the collision will be= $m_1(v_1-u_1)/t$
[1]

Similarly the rate of change of momentum of ball B= $m_2(v_2-u_2)/t$.

Let $F_{12}$ be the force exerted by ball A on ball B and $F_{21}$ be the force exerted by ball B on A. Then according to Newton's second law of motion. [1]

$F_{21}= m_1(v_1-u_1)/t$

$F_{12}= m_2(v_2-u_2)/t$

According to Newton's 3rd law of motion

$F_{21}= -F_{12}$

$m_1(v_1-u_1)/t = -m_2(v_2-u_2)/t.$

[1]

$m_1v_1-m_1u_1= -m_2v_2+m_2u_2$

$m_1u_1+m_2u_2= m_1v_1+m_2v_2$

Total momentum before collision= After collision.

[1]

**OR**

(a) Second law- The rate of change of momentum is directly

[1] proportional to the applied unbalanced force in the direction of force.

Mathematical expression-

F= ma

(b) Thus 1N is the force which produces an acceleration of $1m/s^2$ in a mass of 1 kg in its own direction.

[1]

F= ma

If m= 1 kg, a= $1m/s^2$

F= 1N

(c) F= 525 N, a= 3.5 $m/s^2$

[2]

F= ma, m= F/a= 525/3.5= 150kg

24. (a) Distance traveled. [1]

(b) Uniform motion- if an object covers equal distances in equal intervals of time no matter how small these intervals may be, motion is said to be uniform.

[1+1]

Non uniform motion- if an object covers unequal distances in equal intervals of time, motion is said to be non- uniform.

(c) Distance= $2\pi R/2 = \pi R$

[1+1]

Displacement= Diameter= 2R

**OR**

1. Initial velocity. [1]

2. (a) A distance time table

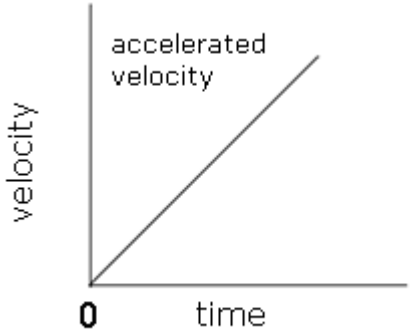
[1]

(b) A distance of 10 km is moved by the bus in equal intervals of time (15 min), so it moves with uniform speed. [1]

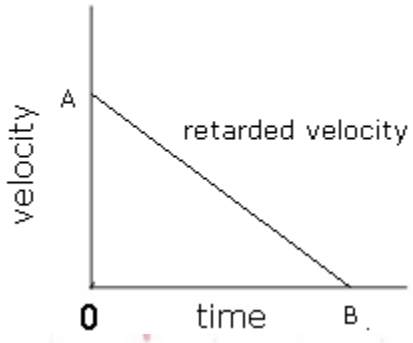
3. (a) Acceleration is defined as the rate of change of velocity.

SI unit is $m/s^2$ [½+½]

(b)




[½+½]






**SECTION B**

25. (a) [1]

26. (d) [1]

27. (c) [1]

28. (d) [1]

29 (d) [1]

30. (b) [1]

31. (a) [1]

32. (d) [1]

33. (c) [1]

34. (b) [1]

35. (a)

36. (a)
[1]

37. (c)
[1]

38. (d)

39. (b) [1]

40. (b)
[1]

41. (b)
[1]

42. (b)
[1]