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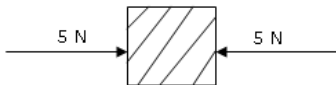
- Balanced forces can change the shape of an object [1]

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)

$$\cancel{m}g = \frac{G\cancel{m}M}{R^2}$$

                                        [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= $\dfrac{10}{1000}$ kg $= 0.01$kg

Velocity= 400m/s

Momentum= $m \times v = .01 \times 400 = 4.00 \, kg \, m/s$

Cricket ball= 400g= 0.4 kg

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

$\therefore v = 20 \, m/s$

$v = u + at$

$20 = 0 + 10 \times t$ [1½]

$\therefore t = 2s$

14. (a) time taken to go up= 6/2= 3s

u= not given, v= 0, a= -10m/s², t= 3s

$v = u + gt$

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

$u = 30m/s$

(b) v²-u²= 2gh

$0 - (30)^2 = -2 \times 10 \times h$ [1]

$h = 900/20 = 45m$

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

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

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

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

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   [½]

harsh weather

(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:
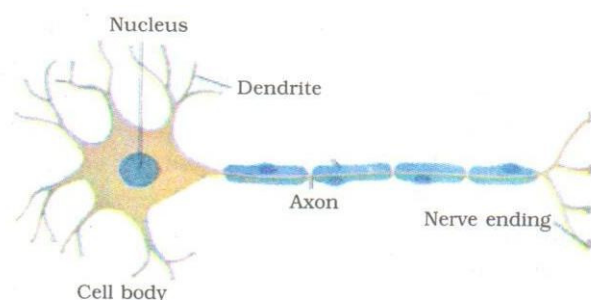
(Any three labellings)   [2]

(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
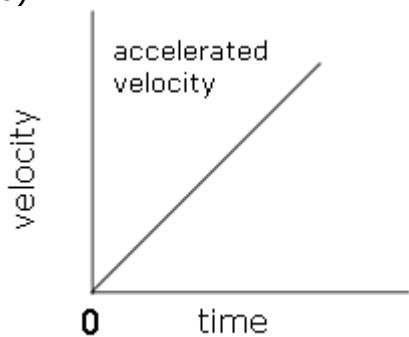   speed.   [1]

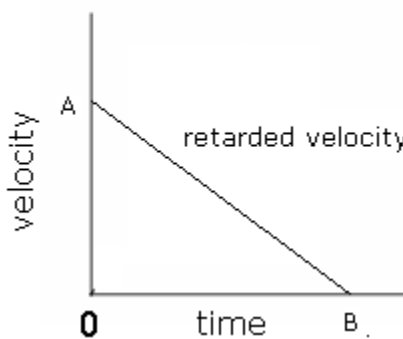3. (a) Acceleration is defined as the rate of change of velocity.

SI unit   is m/s² [½+½]

(b)

accelerated velocity

velocity

0   time

[½+½]

A

velocity   retarded velocity

0   time   B .

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]