CBSE SAMPLE PAPER – 04
SUMMATIVE ASSESSMENT – I
Class-IX SCIENCE

Time: 3 Hrs **MM: 90**

General Instructions

(i) The question paper comprises of two Sections, A and B. You are to attempt both the sections.
(ii) All questions are compulsory.
(iii) Question numbers 1 to 3 in Section-A are one mark questions. These are to be answered in one word or in one sentence.
(iv) Question numbers 4 to 6 in Sections-A are two marks questions. These are to be answered in about 30 words each.
(v) Question numbers 7 to 18 in Section-A are three marks questions. These are to be answered in about 50 words each.
(vi) Question numbers 19 to 24 in Section-A are five marks questions. These are to be answered in about 70 words each.
(vii) Question numbers 25 to 36 in Section-B are multiple choice questions based on practical skills. Each question is a one mark question. You are to select one most appropriate response out of the four provided to you.

Section – A

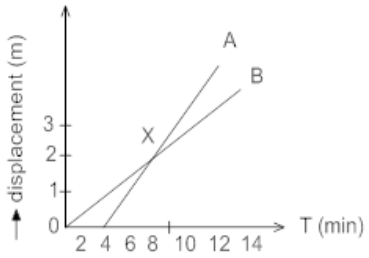
1. What is evaporation?
2. What is a goblet cell?
3. Name the principle on which a rocket works.
4. Water hyacinth floats on water surface. Explain.
5. Which organelle is known as the powerhouse of the cell? Why?
6. A ball is thrown vertically upwards with a velocity of 49 m/s. Calculate the maximum height to which it rises.
7. What do you understand by organic farming?
8. Describe different types of meristems.
9. Write a short note on xylem.
10. State Newton's third law of motion and how does it explain the walking of man on the ground?
11. Enumerate the advantages of mixed farming.
12. How much water should be mixed with 12 mL of alcohol so as to obtain 12 % alcohol solution?
13. (a) Under which category of mixtures will you classify alloys and why?
    (b) A solution is always a liquid. Comment.

(c) Can a solution be heterogeneous?

14. On the earth, a stone is thrown from a height in a direction parallel to the earth's surface while another stone is simultaneously dropped from the same height. Which stone would reach the ground first and why?

15. When small boy is trying to push a heavy stone, mention various forces acting on the stone.

16. Two boys A and B, travel along the same path. The displacement – time graph for their journey is given in the following figure:



(a) How far down the road has B travelled when A starts the journey?

(b) Without calculation, the speed, state who is traveling faster A or B?

(c) What is the speed of A?

(d) What is the speed of B?

17. Discuss the various factors which affect the rate of evaporation. Latent heat of evaporation of two liquids A and B is 100 J/kg and 150 J/kg respectively. Which one can produce more cooling effect and why?

18. Anil and Roshan went to a restaurant to have dinner. Anil picked up the glass of water to drink but he immediately kept it back. He said, "The water was not fit for drinking."

Based on the above information answer the question that follow:

(a) What could be the reason of it?

(b) How could have been the water made fit for drinking? Name the process.

(c) Which values are promoted by the restaurant people here?

19. Write the differences in the characteristics of the three states of matter.

20. Write short note on nucleus. With the help of diagram.

21. Pragya tested the solubility of three different substances at different temperatures and collected the data as given below (results are given in the following table, as grams of substance dissolved in 100 grams of water to form a saturated solution).

Substance dissolved	**Temperature (K)**

	283	**293**	**313**	**333**	**353**
	Solubility				
Potassium nitrate	21	32	62	106	167
Sodium chloride	36	36	36	37	37
Potassium chloride	35	35	40	46	54
Ammonium chloride	24	37	41	55	66

(a) What mass of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 50 grams of water at 313 K?

(b) Pragya makes a saturated solution of potassium chloride in water at 353 K and leaves the solution to cool at room temperature. What would she observe as the solution cools? Explain.

(c) Find the solubility of each salt at 293 K. Which salt has the highest solubility at this temperature?

(d) What is the effect of change of temperature on the solubility of a salt?

22. State the factors on which acceleration due to gravity (g) depends?

23. List the steps to be taken to prevent and control diseases in animals.

24. Abdul, while driving to school, computes the average speed for his trip to be 20 km h^{-1}. On his return trip along the same route, there is less traffic and the average speed is40 km h^{-1}. What is the average speed for Abdul's trip?

Section B

25. Which of the following have least inter atomic spacing?

(a) solid (b) liquid (c) gases (d) plasma

26. Mercury and Bromine are both

(a) liquid at room temperature (b) solid at room temperature

(c) gases at room temperature (d) both (a) and (b)

27. Organisms lacking true nucleus are called –

(a) Eukaryotes (b) prokaryotes (c) Haploids (d) Diploids

28. Intestine absorbs due digested food materials. What type of epithelial are responsible for that?

(a) Stratified squamous epithelium (b) columnar epithelium

(c) pseudostratified epithelium (d) Cuboidal epithelium

29. When a body moves uniformly along the circle, then:

(a) its velocity changes but speed remains the same

(b) its speed changes but velocity remains the same

(c) both speed and velocity changes

(d) both speed and velocity remains same

30. The people in the bus are pushed backwards when the bus starts suddenly due to:-

(a) Inertia due to Rest (b) Inertia due to Motion

(c) Inertia due to direction (d) Inertia.

31. To solve the food problem of the country, which among the following is necessary?

(a) Increased production and storage of food grains

(b) Easy access of people to the food grains

(c) People should have money to purchase the grains

(d) All the above

32. The science of growing vegetables, fruits & ornamental plants is called:

(a) Floriculture (b) Horticulture

(c) Agriculture (d) Animal Husbandry

33. If a moving body comes to rest

(a) Positive (b) negative

(c) Zero (d) All of these depending upon initial velocity.

34. While performing this practical, student A kept the wooden block on polished wooden surface and measured the minimum force required to pull it as F_1 while student B kept wooden block on a rough surface, covered with sand and measured the minimum force required to pull it as F_2. They repeated the experiment 5 times. Which student applied more force to pull the block?

35. Mention the type of thermometer that should be used to determine the melting point of ice in laboratory? What should be the position of bulb of thermometer?

36. Which of the following cannot pass through filter paper? And which one is a transparent solution. Suspension, colloidal solution, true solution.

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ANSWERS

Section A

1. Evaporation is the process by which water (liquid) changes to vapour at any temperature below its boiling point.
2. A goblet cell is a unicellular mucus secreting gland.
3. Newton's third law of motion.
4. Water hyacinth floats on the surface of water due to presence of aerenchyma. It is modified form of parenchyma, which contain air cavities. It provides buoyancy which helps water hyacinth in floating.
5. It is Mitochondria of the cell also k own as the power house of the cell because it synthesizes energy in the form of ATP during respiration which is vital for various life activities.
6. v = u + gt

   $0 = 49 + (-99) \times t$

   $9.8t = 49$

   $t = \frac{49}{9.8}$

   $t = 5$ s

   $h = ut + \frac{1}{2}gt^2$

   $= 49 \times 5 + \frac{1}{2} \times 9.8 \times 25$

   $= 245 - 122.5$

   $= 122.5$
7. Organic farming is a farming system in which there is minimal or no use of chemicals such as fertilisers, herbicides, pesticides, etc. There is maximum input of organic manure, recycled farm wastes, i.e., straw and livestock excreta, use of bio-agents such as culture of blue green algae in preparation of biofertilisers. Also, neem leaves or turmeric is used specifically in grain storage which act as biopesticides. It employs healthy cropping systems (mixed cropping, intercropping and crop rotation).
8. Based on their location in the plant body, meristems are of three types.

(a) **Apical meristems** – Occurs at the tips of roots and shoots and brings about an increase in length of the plant

(b) **Lateral meristems** – It occurs on the sides almost parallel to the long axis of the root, stem and its branches. Brings about an increase in the width or girth of the organs.

(c) **Intercalary meristems** – It occurs at the base of the internodes in monocots. It brings about increase in the length of the internode.

9. Xylem is complex permanent tissue. It consists of tracheid's, vessels, xylem parenchyma and xylem fibres. The cells have thick walls, and many of them are dead. Tracheid's and vessels are tubular structures. This allows them to transport water and mineral vertically. The parenchyma stores food and helps in the sideways conduction of water. Fibres are mainly supportive in function.

10. According to Newton's third law of motion, if a body A exerts a force F on the body B then the body B exerts a force –F on the body A and the forces act along the same line.

When a person walks on the ground, then he pushes the ground backwards with a force F and in reaction the ground also pushes the man in the forward direction and hence the man walks forward.

According to Newton's third law:- Every action has an equal and opposite reaction.

11. Following are the main advantages of mixed farming:

(a) Farmyard manure is made available from livestock which is used again in agricultural farms.

(b) Organic waste material like straw, husks and chaffs of grains, household kitchen waste, etc., are converted into human food through the agency of cattle, sheep, poultry, pigs, etc., as per the choice of farmer.

(c) It provides work to all the members of a family throughout the year, thus providing subsidiary occupation without the need of employing special labour.

(d) Adopting exact combination in mixed farming, income can be increased, e.g., the number of animals can be increased (as per the food/crop available) to enhance milk production.

12. Volume of solute =12 mL

Let the volume of water = x mL

$\therefore$ Volume of solution = (12 + x) mL

Concentration of solution = $\frac{Volume\ of\ solute}{Volume\ of\ solution} \times 100$

$$12 = \frac{12}{12+x} \times 100$$

12+x=100

x = 100 - 12 = 88 mL

So, 88 mL of water should be mixed.

13. (a) Alloys are homogeneous mixture of two or more elements because the constituent elements mix together and give a mixture which is similar throughout.

(b) A solution is always a liquid. It is not always true. A solution may be in solid, liquid or gaseous state.

(c) No, a solution cannot be heterogeneous in nature.

14. For both the stones

Initial velocity, **u** = 0

Acceleration in downward direction = g

Now, $h = ut + \frac{1}{2}gt^2$

$$h = 0 + \frac{1}{2}gt^2$$

$$h = \frac{1}{2}gt^2$$

$$t = \sqrt{\frac{2h}{g}}$$

Both stones will take the same time to reach the ground because the two stones fall from the same height.

15. The various forces acting on the stone are:

(a) The gravitational force exerted by the earth which pulls the stone downwards.

(b) The force of reaction exerted by the ground on the stone vertically upwards.

(c) The force of pushing exerted by the boy.

(d) The force of friction exerted by the stone.

When a small boy tries to push a heavy stone, then all these forces are balanced, and therefore the stone does not move.

16. (a) When A starts his journey at 4 sec, B has already covered a distance of 857m.

(b) A travels faster than B because A starts his journey late but crosses B and covers more distance then B in the same time as B

(c) Speed of A = $\frac{Dis\tan ce\ \ \text{cov}ered}{time\ taken}$

Let at t =12 min, distance covered = 3500m

$= \frac{3500}{12} = 375m/\min$

(d) Speed of B = $\frac{dis\tan ce\ \ \text{cov}ered}{time\ \text{taken}}$

$V_B = \frac{3000}{12} = 214m/\min$

17. Factors affecting the rate of evaporation:

(a) **Surface area:** The rate of evaporation increases with increase in surface area.

(b) **Temperature:** The rate of evaporation increases with increase in temperature.

(c) **Humidity:** The rate of evaporation decreases with increase in humidity.

(d) **Wind speed:** The rate of evaporation increases with increase in wind speed.

(e) **Nature of the liquid:** The volatile compounds evaporate faster than less volatile compounds (liquids).

B will produce more cooling effect because it will absorb more heat from the surroundings for evaporation.

18. Heavy suspended particles might be floating in water served for drinking

(ii) Water could been made fit for drinking by adding alum to the water. The heavy particles of dissolved alum deposit on the finer suspended particles. The suspended particles become heavy and settle down at the bottom of the tank. This process is known as sedimentation.

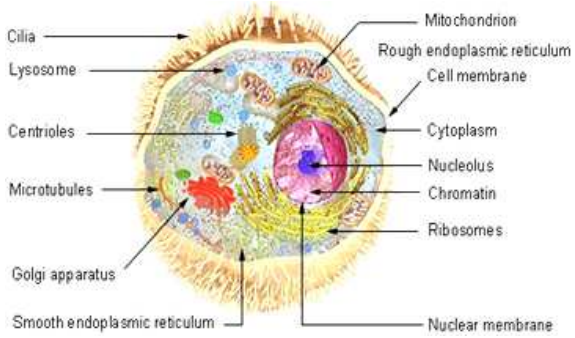
(iii) Ignorance, carelessness, unhygienic condition of water.

19.

Solids	Liquids	Gases
Particles are closely packed.	Particles are loosely packed.	Particles are at a sufficient distance apart.
Attraction forces are highest.	Attraction forces are less than that of solids.	Attraction forces are minimum.
They possess definite shape, mass and volume.	They do not possess definite shape but possess definite mass and volume.	They possess neither definite shape nor definite volume, but possess

		definite mass.
The particles are fixed and possess the least energy.	Particles are free to move and have higher energies than	The particles have maximum freedom of motion and possess maximum energies.
They have least compressibility.	They have higher compressibility than solids.	They have the highest compressibility.
They possess the highest density.	They possess lower density than that of solids.	They possess least density.

20. Nucleus is also known as the 'boss of the cell'. It is generally centrally placed. It is bounded by nuclear membrane, in which nuclear pores are present. The fluid inside the nucleus in called nucleoplasm. Nucleoplasm contain thread like structure called chromatin and nucleolus. Chromatin contains DNA, which condensed to form chromosomes during cell division. Nucleolus synthesize ribosomes.



21. (a) Solubility of potassium nitrate at 313 K (given)

Mass of potassium nitrate = 62 g

Mass of solvent (water) = 100 g

Therefore, the mass of potassium nitrate to obtain a saturated solution at

$$313\text{ K} = \frac{62g \times 50g}{100g} = 31\text{ g}$$

Thus, 31 g of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 50 g of water at 313 K.

(b) On cooling, the solubility of a salt decreases with the falling temperature. Hence, the crystals of potassium chloride will separate out on cooling.

(c) The solubilities of different salts at $20°C$ (i.e., 293 K) in 100 g of water are given in column 2 in the table. From the given data, it is clear that ammonium chloride has the highest solubility (37 g/100 g of water).

(d) Generally, the solubility of a salt increases with the increasing temperature. However, from the data given in the table, it is apparent that the solubility of sodium chloride changes very little with increasing temperature.

22. Acceleration due to gravity depends upon:-

(1) Height above at a height 'h' above the earth → The acceleration due to gravity on going above earth decreases as

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

so if R $\Rightarrow R + h$ (at a height h)

$$g^1 = \frac{GM}{(R+h)^2}$$

so, g^1 will be less

(2) Rotation of earth → Since the earth rotates about it polar axis;

The radius of the circle decreases as we move from the equator to the poles, acceleration due to gravity increases as we move from equator to poles.

(3) Shape of earth → The radius of the earth is more at the equator and less at poles so acceleration due to gravity increases as we move from equator to poles.

23. Steps to be taken to control diseases are:

(a) Providing proper shelters.

(b) Ensuring animal hygiene and proper disposal of dead animals and animal wastes.

(c) Periodic screening of animals for diseases and immediate isolation of diseased animals.

(d) Providing proper diet and suitable medicines under the advice of a veterinary doctor.

(e) Hygienic handling of all animal products and by products.

(f) Compulsory vaccinations.

24. If we suppose that distance from Abdul's home to school = x kms

while driving to school:-

speed = 20 km h^{-1},

velocity = $\frac{displacement}{time}$

$20 = \frac{x}{t}$

$t = \frac{x}{20}$ hr

on his return trip:-

speed = $40km^{-1}$,

$40 = \frac{x}{t'}$

$t' = \frac{x}{40}$ hr

total distance travelled = x + x = 2x

total time = t + t'

$= \frac{x}{20} + \frac{x}{40}$

$\frac{(2x+x)}{40} = \frac{3x}{40}$ hr

average speed for Abdul's trip = $\frac{2x}{\frac{3x}{40}} = \frac{80x}{3x}$

= 26.67km/hr

Section B

25. (a)
26. (a)
27. (b)
28. (b)
29. (a)
30. (a)
31. (a)
32. (b)
33. (b)
34. Student B applied more force to pull the block. This is because frictional forces depend on roughness of surface. More is the surface rough, more is interlocking, more frictional force, hence more limiting force.

35. Thermometer used for measuring the melting point of ice is laboratory thermometer. The two precaution includes

    (a) Thermometer knob should not touch the bottom.

    (b) Ice should be perfectly crushed.

36. Suspension cannot pass through the filter. True solution forms transparent solution as solute and solvents are uniformly intermixed.