

Class IX  
Sample Paper 1

Time allowed: 3 hours

maximum Marks: 90

General Instructions:

1. The question paper comprises of two sections, A and B you are to attempt both the sections.
2. All questions are **compulsory**.
3. There is no overall choice. However, internal choice has been provided in all the three questions of five marks category. Only one option in such question is to be attempted.
4. All questions to section A and all questions of section B are to be attempted separately.
5. Question numbers 1 to 3 in section A are one mark questions. These are to be answered in one word or one sentence.
6. Question numbers 4 to 7 are two mark questions, to be answered in about 30 words.
7. Question number 8 to 19 is three mark questions, to be answered in about 50 words.
8. Question number 20 to 24 are five mark questions, to be answered in about 70 words.
9. Question numbers 25 to 42 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are choosing one most appropriate response out of the four provided to you.

**SECTION A**

- Q1. What is the value of latent heat of vapourisation of water? [1]
- Q 2. Why do we tie the luggage's with a rope on the roof of buses? [1]
- Q 3. Name the discover of (a) cell and (b) nucleus [1]
- Q4 (a) A diamond knife is quite often used for cutting glass. Why?  
(b) Give example of the colloidal solution in which solid acts as the dispersed phase and gas as the dispersion medium. [2 ]
- Q 5. A nail is driven into a wooden board by using a hammer. The impact of the hammer on the head of nail produces a thrust of 25N. If the area of the head is  $0.5 \text{ mm}^2$  and of the tip is  $0.1 \text{ mm}^2$ , find the pressure on the head and the tip of the nail. [2]
- Q 6. Mention two functions of stomata. [2]
- Q 7. What is endocytosis? Give one example. [2]

- Q8. (a) We can easily move our hand in air but to do so the same through a solid block of wood we need a 'karate expert'. Explain.  
(b) What types of clothes should we wear in summer? [3 ]
- Q9 (a) Solubility of sodium nitrate at 313 K is 60 g. What mass of sodium nitrate would be needed to produce a saturated solution of  $\text{NaNO}_3$  in 50 g of water at 313 K? (b) What is the effect of change of temperature on the solubility of a salt? [3 ]
- Q 10. A car is moving on a straight road with a uniform acceleration. The following table gives the speed of the car at various instants of time. [3]
- |                            |   |    |    |    |    |    |
|----------------------------|---|----|----|----|----|----|
| Time (s)                   | 0 | 10 | 20 | 30 | 40 | 50 |
| Speed ( $\text{ms}^{-1}$ ) | 5 | 10 | 15 | 20 | 25 | 30 |
- (i) Draw the shape of speed-time graph representing the above sets of observations.  
(ii) Find the acceleration of the car.
- Q 11. (a) Define momentum of a body. [3]  
(b) A ball is thrown vertically upward. What is its momentum at the highest point?  
(c) State the law of conservation of momentum.
- Q 12. State universal law of gravitation. Write SI unit of G. The gravitational force between two objects is 100N. How should the distance between the objects be changed so that force between them becomes 50N? [3]
- Q 13. A ball is gently dropped from a height of 20 m. If its velocity increases uniformly at the rate of  $10\text{m/s}^2$ , with what velocity will it strike the ground? After what time will it strike the ground? [3]
- Q 14. A particle is thrown up vertically with a velocity of  $50\text{ms}^{-1}$ . How high would the particle rise and what time would it take to reach the highest point? ( $g = 10\text{ms}^{-2}$ ) [3]
- Q 15. What factors may be responsible for losses of grains during storage? Also mention any two preventive measures to control loss of grains during storage. [3]
- Q 16. Explain that livestock production needs to be improved. Why there is necessity of Animal Husbandry? [3]
- Q 17. Draw a well labeled diagram of phloem tissue. [3]
- Q 18. Write three main difference between a prokaryotic cell and eukaryotic cell? [3]
- Q 19. What are the three types of muscle tissue. [3]
- Q20 Give any five points of difference between true solution, colloidal solution and suspension. [5]

OR

Q20 (a) Identify solute and solvent in the following solutions:

- (i) Aerated drinks
- (ii) Tincture of iodine
- (iii) Lemon water

(b) State the principle of each of the following methods of separation of mixtures.

- (i) Centrifugation method
- (ii) Separation using separating funnel. [5]

Q21 (a) Write any two points of differences between chemical and physical change?

(b) State one instance where water undergoes a physical change and one in which it undergoes a chemical change.

(c) Which of the following substances can sublime: camphor or water? [5]

OR

Q21 (a) Which is more effective in cooling ice at  $0^{\circ}\text{C}$  or water at  $0^{\circ}\text{C}$ ? Explain

(b) Why do we feel relief under a fan after perspiring? [5]

Q 22. (a) How much momentum will a dumbbell of mass 20 kg transfer to the floor if it falls from a height of 1m?

Take its downward acceleration to be  $10\text{ m/s}^2$ .

(b) The earth attracts a ball with a force of 1 N. If this is the force of action, what would be the force of reaction and who exerts this force? [5]

OR

(a) Write the three essential characteristics of the forces to be classified as action-reaction forces.

(b) A cannon of mass 1000 kg launches a cannonball of mass 10 kg at a velocity of 100 m/s. At what speed will the cannon recoil? [5]

Q 23. (a) How does uniform linear motion differ from uniform circular motion? Give two points of difference.

(b) A bus travels a distance of 120 km with a speed of 40 km/h and returns with a speed of 30 km/h. Calculate the average speed for the entire journey. [5]

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.

(b) A train 100 m long is moving with a velocity of  $60\text{ kmh}^{-1}$ . Find the time it takes to cross the bridge 1 km long. [5]

Q 24 (a) How do biotic and abiotic factors affect crop production?

(b) How do plants get nutrients?

(c) What is pasturage? [5]

OR

(a) What are the advantages of intercropping and crop rotation? Mention any two points.

- (b) Which method is commonly used for improving cattle breeds and why?  
(c) What is meant by hybridization? [5]

**SECTION B**

Q25. When dispersing medium is liquid and dispersed phase is a gas, it is called

- a) Aerosol  
b) Sol  
c) Gel  
d) Foam

Q26. A student was asked to mix the white of an egg with water and stir well. The student observed that

- (a) A transparent solution is formed  
(b) A translucent mixture solution is formed  
(c) Egg white settles down at the bottom  
(d) Egg white floats on the surface

Q27. Add dil  $\text{H}_2\text{SO}_4$  to a mixture of iron and sulphur, we would observe

- (a) FeS reacts with dil Sulphuric acid to give  $\text{H}_2$  gas  
(b) Mixture of iron and Sulphur reacts with dil. Sulphuric acid to give hydrogen gas  
(c) FeS does not react with sulphuric  
(d) Mixture of iron and sulphur reacts with sulphuric acid to give hydrogen gas.

Q28. When iron and sulphuric are heated at high temperature

- (a) Yellow coloured iron sulphide formed  
(b) Black coloured FeS is formed  
(c) Mixture of iron and sulphur is formed  
(d) They do not react

Q29. While determining the boiling point of water pumice stone pieces is added to:

- (a) Spread the heat uniformly  
(b) Prevent loss of heat energy  
(c) To avoid bumping  
(d) Copper avoid cracking of the glass container

Q30. The melting point of pure ice is

- (a)  $0^\circ\text{C}$   
(b)  $1^\circ\text{C}$   
(c)  $-1^\circ\text{C}$   
(d)  $4^\circ\text{C}$

Q31. The colour of the pure ammonium chloride is

- (a) White
- (b) Blue
- (c) Green
- (d) red

Q32. In the laboratory, what precautions has to be taken with carbon disulphide?

- (a) Keep away from flame.
- (b) Keep away from carbon.
- (c) Keep away from distilled water.
- (d) Keep way from iron sulphide.

Q33. When lead nitrate decomposes, it produces brown fumes of

- a) NO
- b) NO<sub>3</sub>
- c) NO<sub>2</sub>
- d) HNO<sub>2</sub>

Q34. Which is not observed when carbon disulphide is added to a mixture of iron filings and sulphur powder taken in a boiling tube?

- (a) Iron filings will remain unaffected.
- (b) Sulphur powder will dissolve to give a yellow solution.
- (c) Sulphur powder will remain unaffected
- (d) Iron sulphide (FeS) will not be formed.

Q 35. The sum of the forces acting on two spring balances is always

- (a) Positive
- (b) Zero
- (c) Negative

Q 36. Least count of a spring balance is 1 kgwt. per division. If the reading on this spring balance is 5 div, the force acting on it will be,

- (a) 5 N
- (b) 5 dyne
- (c) 5g N
- (d) 5g dyne

Q 37. On the laboratory table were placed four watch glasses with labels A, B, C and D. Watch glass 'A' had chalk powder 'B' had chalk powder 'B' had sago powder, 'C' had common salt and D had powdered sugar. On adding two drops of iodine to the content of each watch glass the one turning blue black will be:

[1]

- (a) A  
(b) B  
(c) C  
(d) D
- Q 38. Four samples of arhar dal were taken in four test tubes with some water in each and labeled P, Q, R and S. A few drops of the following were added to these test tubes, water to test tube P, HCl to test tube Q, NaOH to test tube R and alcohol to test tubes S. We would be able to confirm adulteration of the dal with mentanil yellow in test tubes:  
[1]  
(a) P and Q  
(b) Q and R  
(c) R and S  
(d) S and P
- Q 39. Given below are four operations for preparing a temporary mount of human cheek cells:  
[1]  
(a) taking scraping from inner side of the cheek and spreading it on a clean side.  
(b) putting a drop of glycerine on the material  
(c) adding two or three drops of methylene blue  
(d) rinsing the mouth with fresh water and disinfectant solution  
The correct sequence of three operations is:  
(a) a - b - c - d  
(b) d - a - c - b  
(c) d - a - b - c  
(d) a - c - b - d
- Q 40. Human cheek cells stained in methylene blue and mounted in glycerine were observed with the help of a compound microscope. The Components of the cell which would be seen are:  
[1]  
(a) cell wall, cytoplasm, nucleus  
(b) plasma membrane, cytoplasm, nucleus  
(c) plasma membrane, cytoplasm, nucleus, mitochondria  
(d) plasma membrane, cytoplasm, nucleus, mitochondria, golgi bodies, lysosomes
- Q 41. You are shown two slides of plant tissues parenchyma and sclerenchyma you can identify the sclerenchyma by the: [1]  
(a) location of nucleus  
(b) thickness of cell wall  
(c) size of cells  
(d) position of vacuoles
- Q 42. Gurjot observed nerve cells under the microscope, and made a sketch. The mistake in his drawing is the cyton with [1]  
(a) cilia  
(b) dendrites  
(c) nucleus  
(d) cytoplasm

Class IX  
Sample Paper 1  
Solutions

### SECTION A

Ans1. 22.6 KJ/Kg [1]

Ans 2. When the bus is stopped suddenly, the luggage kept on the top will tend to fall off due to inertia of motion. To avoid this they have to be tied with a rope. [1]

Ans 3. (a) Cell: Robert Hooke [½]  
(b) Nucleus: Robert brown [½]

Ans4 (a) Diamond is probably the hardest substance known. Therefore, a knife made from a special type of diamond is used for cutting glass. [1]

(b) Dust storm in which solid particles are dispersed in air. [1]

$$\text{Ans 5. } P_1 = \frac{F}{A_1} = \frac{25 \text{ N}}{0.5 \times 10^{-6} \text{ m}^2} = 50 \times 10^6 \text{ Nm}^{-2} \quad [1]$$

$$P_2 = \frac{F}{A_2} = \frac{25 \text{ N}}{0.1 \times 10^{-6} \text{ m}^2} = 25 \times 10^7 \text{ Nm}^{-2} \quad [1]$$

Ans 6. Functions of stomata:

(i) It helps in exchange of gases.

[1]

(ii) It helps in the transpiration.

[1]

Ans 7. The flexibility of the cell membrane also enables the cell to engulf in food and other material from its external environment. Such processes are called endocytosis.

[1] Amoeba engulfs its food by endocytosis.

[1]

Ans8 (a) In air, the interparticle spaces is very large and the interparticle forces are quite weak. These can be easily overcome. That is why our hand can move in air. [1]

But in a solid block, the constituents particles are quite close and the interparticle forces are very strong. In this case, if one has to move his hand through a solid, it will be extremely difficult. Only a karate expert may do so. [1]

(b) In summer we perspire more, therefore to keep our body cool we must wear cotton clothes. [1]

Ans9 (a) Amount of  $\text{NaNO}_3$  dissolve in 100 g of water = 60 g [1/2]

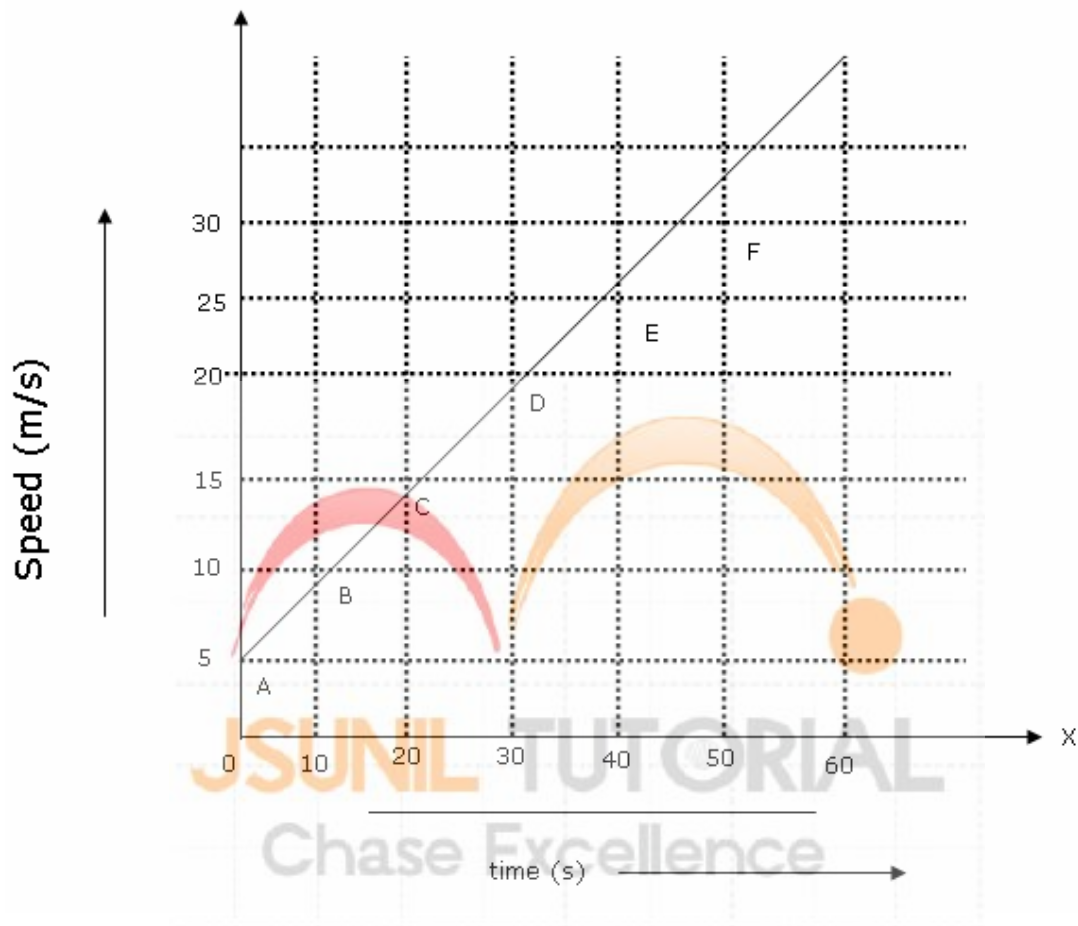
$$\text{Amount of } \text{KNO}_3 \text{ dissolve in 50 g of water} = \frac{60 \times 50}{100}$$

$$= 30\text{g} \quad [1]$$

So, 30g of  $\text{NaNO}_3$  would be needed to produce a saturated solution of  $\text{NaNO}_3$ . [1/2]

(b) The solubility of a salt increases with increase in temperature and decreases with decrease in temperature. [1]

Ans 10. (i)



[2]

(ii)  $a = \frac{(10 - 5) \text{ms}^{-1}}{(10 - 0) \text{s}} = \frac{5 \text{ms}^{-1}}{10 \text{s}} = 0.5 \text{ms}^{-2}$  [1]Ans

Ans 11. (a) Product of mass and velocity of the body

[1]

(b) At highest point

$V = 0 \therefore p = mv = 0$

[1]

(c) Total momentum after collision is equal to total momentum before collision provided no external unbalanced forces act.

[1]

Ans 12. (a) Statement of law of gravitation unit of G

[1]



$$F_1 = 100\text{ N} \quad F_2 = 50\text{ N}$$

$r_1$  = original distance;  $r_2$  new distance [1]

$$F \propto \frac{1}{r^2}$$

$$\frac{F_1}{F_2} = \left[ \frac{r_2}{r_1} \right]^2 = \left[ \frac{100}{50} \right]^2 = 2^2$$
[1]

$$\frac{r_2}{r_1} = \sqrt{2}; \quad r_2 = \sqrt{2} \cdot r_1$$

Ans 13.  $u = 0, s = 20\text{ m}, a = 10\text{ m/s}^2$

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

$$v^2 = 2 \times 10 \times 20$$
[1½]

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

$$v = u + at$$

$$20 = 0 + 10 \times t$$

$$\therefore t = 2\text{ s}$$
[1½]

Ans 14. At highest point  $v = 0$

$$v^2 - u^2 = 2gh$$
[½]

$$0^2 - (50)^2 = 2(-10)h$$
[½]

$$h = \frac{-2500}{-20} = 125\text{ m}$$
[½]

$$v = u + gt$$
[½]

$$0 = 50 + (-10)t$$

$$t = \frac{50}{10} = 5\text{ s}$$
[½]

Ans 15. Factors responsible for such losses are biotic-insects, rodents and abiotic-inappropriate moisture and temperatures in the place of storage.

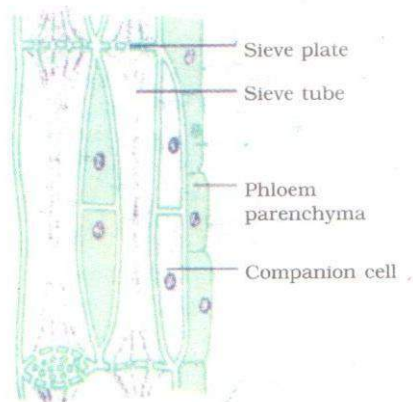
[1]

Preventing measures include strict cleaning of the produce before storage, proper drying of the produce first in sunlight and then in shade and fumigation. [2]

Ans 16 The growing awareness of the need for human treatment of livestock has brought in new limitations in livestock farming. Thus livestock production needs to be improved. Animal husbandry is the scientific management of animal livestock. It includes various aspects such as feeding, breeding and disease control. Animal-farming includes cattle, goat, sheep, poultry and fish farming. As the population increases and as living standards increase, the demand for milk, eggs and meat also growing up.

[3]

Ans 17 Diagram of Phloem tissue:



(d) Section of phloem

[3]

Ans 18. Difference between Prokaryotic and Eukaryotic cell:

Prokaryotic cell	Eukaryotic cell
1. Prokaryotic cells have no nucleus.	1. Eukaryotic cells have a true nucleus.
2. They do not have membrane – bound organelles.	2. They contain membrane – bound organelles.
3. They have circular chromosome.	3. They have linear chromosome.

[½ x6]

Ans 19. The 3 types of muscle tissue are:

- (i) Striated muscle: - striated or skeletal are voluntary muscle showing alternate light & dark striations and are attached to bones. [1]
- (ii) Smooth muscle: - They are spindle – shaped involuntary muscle having a single nucleus. [1]
- (iii) Cardiac muscle: - They are cyclindrical, branched uninucleated and involuntary muscles found only in heart. [1]

Ans20.

Solution	Colloidal solution	Suspension
(i) It is homogeneous.	It appears to be homogeneous but actually it is heterogeneous.	It is heterogeneous.
(ii) The particles are very small, i.e., less than $10^{-9}$ m.(1nm)	The particles 10 to 1,000 nm [ $1\text{nm}=10^{-9}\text{m}$ ] (larger than those of solution)	The particles are larger than 1000 nm in diameter.
(iii) The particles are not even visible with a powerful microscope.	The particles are visible with the help of an electron microscope.	The particles are visible even with a naked eye.
(iv) The entire solution	The particles can be pass	The particles cannot pass through

passes through filter paper.  (v) The solute particles do not show Tyndall effect.	through ordinary filter papers.  The particles show Tyndall effects.	filter paper.  They may or may not show Tyndall effect.
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(1 X 5)

OR

- (a) (i) CO<sub>2</sub> (gas) solute and water as solvent. [1]  
 (ii) Iodine (solid) as solute and alcohol (liquid) as solvent [1]  
 (ii) Sugar and lemon as solute and water (liquid) as solvent. [1]
- (b)  
 (i) Denser particles are forced to the bottom and the lighter particles stay at the top when spun rapidly. [1]  
 (ii) Immiscible liquids separate out in layers depending on their densities. [1]

- Ans21 (a) Two correct differences-  
 Physical change-  
 (i) No change in chemical composition of the substance.  
 (ii) No new substance is formed [1/2 x2]
- Chemical change-  
 (i) Always change in the chemical composition of a substance  
 (ii) New substance is formed [1/2 x2]
- (b) Physical change: Freezing of water into ice/boiling of water to form steam [1]  
 Chemical change: electrolyses of water to form hydrogen and oxygen [1]  
 (c) Camphor [1]

OR

- Ans21 (a) Ice at 0°C is more effective in cooling than water at 0°C. [1]  
 Cooling takes place when heat is removed from the system. At 0°C ice takes away the latent heat from the surrounding and converts itself in water. Thus there is a change in physical state of ice. [1]  
 In case of water at 0°C there is no change of state. Hence in water lesser energy is taken away from the surrounding i.e. there is little cooling. [1]  
 (b) Air from the fan causes rapid evaporation of sweat. During this evaporation sweat takes away heat from the body. [1]  
 Evaporation causes cooling which eventually gives us relief. [1]

Ans 22. (a) Velocity of the dumbbell when it strikes the floor:

$$v^2 - u^2 = 2aS$$

$$v^2 = 2 \times 10 \times 1 = 20$$

$$v = 4.47 \text{ m/s}$$

As momentum  $p = mv$

$$p = 20 \times 4.47 = 89.4 \text{ kg m/s} \quad [3]$$

(b) As the earth is attracting the ball with a force of 1 N, the ball will also attract the earth with the same force i.e. 1 N.

Ball exerts force of reaction on the earth towards itself. [2]

OR

(a) The two important characteristics of action-reaction forces are:

1. They are equal to each other.
  2. They act on two different bodies.
  3. They act in opposite directions.
- [3]

(b) Comparing the momenta before & after the firing:

$$M_c v_c + M_b v_b = 0$$

$$v_c = - M_b v_b / M_c = - 10 \times 100 / 1000 = - 1 \text{ m/s}$$

The cannon will recoil with a velocity of 1 m/s in the direction opposite to the canon ball. [2]

Ans 23.

(a) [1×2=2]

Uniform linear motion	Uniform circular motion
<ol style="list-style-type: none"> <li>1. The body moves around a straight line.</li> <li>2. Acceleration is zero, as velocity remains constant.</li> </ol>	<ol style="list-style-type: none"> <li>1. The body moves along a circular path.</li> <li>2. It is an accelerated motion, due to continuous change in velocity due to change in direction.</li> </ol>

(b) Speed for forward journey =  $v_1 = 40 \text{ km/hr}$

Time for forward journey =  $t_1 \text{ hr}$

Speed for return journey =  $v_2 = 30 \text{ km/hr}$

Time for forward journey =  $t_2 \text{ hr}$

Let the distance covered in one direction be  $x$  km

[1/2]

∴ Total distance covered =  $2x$  km

$$\text{Average speed} = \frac{\text{Total distance covered}}{\text{total time taken}}$$

[1/2]

$$= \frac{2x}{t_1 + t_2}$$

$$\text{Now time} = \frac{\text{distance}}{\text{speed}}$$

[1/2]

$$t_1 = \frac{x}{v_1} \quad t_2 = \frac{x}{v_2}$$

[1/2]

$$\text{Av speed} = \frac{2x}{\frac{x}{v_1} + \frac{x}{v_2}}$$

$$= \frac{2x}{\frac{x}{40} + \frac{x}{30}} = \frac{2x}{\frac{30x + 40x}{40 \times 30}}$$

[1/2]

$$= \frac{2 \times 40 \times 30}{70} \approx 34.3 \text{ km/h}$$

[1/2]

OR

(a) For first 30 km:

Distance = 30 km

Speed = 40 km/h

Time ( $t_1$ ) =  $30/40 = 3/4$  h

For next 30 km:

Distance = 30 km

Speed = 20 km/h

Time ( $t_2$ ) =  $30/20$  h =  $3/2$  h

Average speed = total distance/total time

$$= (30+30)/(3/4+3/2)$$

$$= 80/3$$

$$= 26.67 \text{ km/h (approx.)}$$

[1]

[1]

[1]

(b) Total distance to be traveled =  $100+1000 = 1100$  m

[1]

$$v = 60 \text{ kmh}^{-1} = \frac{50}{3} \text{ ms}^{-1}$$

[1]

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

Ans 24. (a) Combination of biotic and abiotic factors causes:

- (i) Infestation of insects.
- (ii) Weight loss.
- (iii) Poor germination ability.

(iv) Discolouration.

[ $\frac{1}{2} \times 4$ ]

(b) Nutrients which are found in soil get dissolved in water and is absorbed by the roots of the plants. The conducting tissue xylem transport this water to different parts of the plant.

[2]

(c) The pasturage means the flowers available to the bees for nectar and pollen collection.

[1]

OR

(a) Advantages of using intercropping:

(1) It helps to maintain the soil fertility.

(2) It increases productivity per unit area

[ $\frac{1}{2}, \frac{1}{2}$ ]

Advantages of using Crop Rotation:

(1) It helps in weed control.

(2) It minimize pest infestation and diseases.

[ $\frac{1}{2}, \frac{1}{2}$ ]

(b) The method used for improving cattle breeds is cross breeding. Cross breeding is a process in which indigenous varieties of cattle are crossed by exotic breeds to get a cross breed which is high yielding.

[2]

(c) Hybridisation refers to crossing between genetically dissimilar plants.

[1]

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Ans 25: (d) [1]

Ans 26:(b) [1]

Ans 27: (d) [1]

Ans 28: (b) [1]

Ans 29: (c) [1]

Ans 30: (a) [1]

Ans31: (a) [1]

Ans 32: (a) [1]

Ans 33: (c) [1]

Ans 34: (c) [1]

Ans 35. (b) [1]

Ans 36. (c) [1]

37. (b) [1]

38. (a) [1]

39. (b) [1]

40. (b) [1]

41. (b) [1]

42. (a) [1]

