Sample Question Paper
SCIENCE
Class-IX
Term - I (2011-2012)

TIME : 3 Hrs   **MM : 90**

S.No.	CONTENT	Marks (Theory)	Marks MCQ	Total Marks
1.	Food	11	2	13
2.	Matter-Its nature & behaviour	19	10	29
3.	Organisation in the living world	14	4	18
4.	Motion, Force and work	28	2	30
	Total	**72**	**18**	**90**

WEIGHTAGE TO FORM OF QUESTIONS

S.No.	Type of Questions	Marks for each question	No. of questions	Total Marks
1.	VSA	1	3	3
2.	SA-I	2	4	8
3.	SA-II	3	12	36
4.	LA	5	5	25
5.	MCQ	1	18	18
	TOTAL		**42**	**90**

Scheme of Options:

There will be no overall choice. However there is an internal choice in every question of 5 marks category.

Weightage to difficulty level of questions:

Easy	15%
Average	70%
Difficult	15%

Typology of questions:

In order to assess different activities related to the subject, the question paper includes open ended questions, drawing/illustrations based question, communication skill based questions and activity based questions.

S.N.	Form of Questions / Unit	VSA	SA-I	SA-II	LA	MCQ	Total
1.	Food	–	–	6(2)	5(1)	2(2)	13(5)
2.	**Matter - Its nature and behaviour**						
	a) Matter is our Surroundings	1(1)	–	3(1)	5(1)	5(5)	
	b) Is Matter around us pure?	–	2(1)	3(1)	5(1)	5(5)	29(16)
3.	**Organisation in the living world**						
	a) Fundamental unit of life	1(1)	2(1)	3(1)	–	2(2)	
	b) Tissues	–	2(1)	6(2)	–	2(2)	18(10)
4.	**Motion, Force and Work**						
	a) Motion	–	–	3(1)	5(1)		
	b) Force and laws of motion	1(1)	–	6(2)	5(1)	2(2)	30(11)
	c) Gravitation	–	2(1)	6(2)	–	–	
	Total	3(3)	8(4)	36(12)	25(5)	18(18)	90(42)

SCIENCE
Class-IX
Term - I (2011-2012)

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) *There is no overall choice. However internal choice has been provided in all the five questions of five marks category. Only one option in such questions is to be attempted.*

iv)   *All questions of section A and all questions of section B are to be attempted separately.*

v)   *Question numbers 1 to 3 in section A are one mark questions. These are to be answered in one word or one sentence.*

vi)   *Question numbers 4 to 7 are two mark questions, to be answered in about 30 words each.*

vii) *Question numbers 8 to 19 are three mark questions, to be answered in about 50 words each.*

viii) *Question numbers 20 to 24 are five mark questions, to be answered in about 70 words each.*

ix)   *Question number 25 to 42 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are to choose one most appropriate response out of the four provided to you.*

SECTION -A

1. A gas jar containing air is inverted over another containing NO_2 gas which is brown in colour and heavier than air. After some time brown colour is seen in the inverted gas jar too. Identify the phenomenon associated with this observation.

2. A passenger in a moving train tosses a coin which falls behind him. State the type of motion of the train.

3. Name the plastid involved in conversion of a green tomato to red.

4. List four reasons to support that water is a compound and not a mixture.

5. A man weighs 600N on the surface of earth. What would be his mass and weight on the surface of moon? (take of g_{earth} = 10m/s^2).

6. State one feature that is similar and one feature that is dissimilar with respect to mitochondria and plastids.

7. Show the location of meristematic tissues in a plant diagramatically. Which meristem is responsible for the transformation of the stem of a plant into the trunk when it grows into a tree?

8. (a) A spoonful of sugar is added to a beaker containing 500 ml of water and stirred for a while. State any two observations that you will make.

   (b) Account for your observations.

9. Distinguish between homogeneous and heterogeneous mixture. Classify the following mixtures as homogeneous and heterogeneous -

   (i) Tincture of iodine

   (ii) Smoke

   (iii) Brass

   (iv) Sugar solution

10. Derive graphically the equation for position-time relation for an object travelling a distance 's' in time 't' under uniform acceleration.

11. State the law of inertia. Why do we fall in the forward direction if a moving bus stops suddenly and fall in the backward direction if it suddenly accelerates from rest?

4

12. What happens to the magnitude of the force of gravitation between two objects if -

    (i)   Distance between the objects is tripled?

    (ii)   Mass of both objects doubled?

    (iii)   Mass of both objects as well as the distance between them is doubled?

13. Derive the relation between force and acceleration. Define one unit of force.

14. A stone dropped from a window reaches the ground in 0.5 seconds -

    (i)   Calculate its speed just before it hits the ground.

    (ii)   What is its average speed during 0.5 s?

    (iii)   Calculate the height of window from the ground.

15. (a) State two ways in which phloem is functionally different from xylem.

    (b) Draw a neat diagram of a section of phloem and label four parts.

16. Give one important functional difference amongst the muscle tissues and draw a labelled diagram of the muscle tissue which never shows fatigue.

17. Which cell organelle would you associate with elimination of old and worn out cells? Why?

18. State one difference between dugwells and tubewells. Explain any two fresh initiatives taken to increase the water available for agriculture.

19. (a) Which two factors bring about loss of food grains during storage? Give one example for each.

    (b) State any two control measures to be taken before grains are stored.

20. (a) Distinguish among true solution, suspension and colloid in a tabular form under the following heads:

    (i)   Stability   (ii)   Filterability

    (iii)   Type of mixture

    (b) What is meant by concentration of a solution? How will you prepare a 10% solution of glucose in water?

OR

(a) Draw a neat and labelled diagram of the apparatus used to separate components of blue-black ink. Name the process and state the principle involved.

(b) Identify the physical and chemical changes from the following:

(i)   Burning of magnesium in air.

(ii)   Tarnishing of silver spoon.

(iii) Sublimation of iodine.

(iv)   electrolysis of water.

21. (a) State one similarity and one difference between evaporation and boiling.

(b) List four factors which affect the rate of evaporation.

(c) Describe an activity to show that water vapour is present in air.

OR

Distinguish solids, liquids and gases in a tabular form under the following characteristics-

(i)   Rigidity

(ii)   Compressibility

(iii) Inter-particle forces of attraction

(iv)   Inter-particle spaces

(v)   Kinetic energy of particles

22.   Define momentum. State its S.I. unit.

An object of mass 50 kg. is accelerated uniformly from a velocity of $4ms^{-1}$ to $8ms^{-1}$ in 8s. Calculate the initial and final momentum of the object. Also find the magnitude of the force exerted on the object.

OR

State the law of conservation of momentum. Why is a person hit harder when he falls on a hard floor than when he falls on sand from the same height?

A bullet of mass 20g is fired horizontally with a velocity $100ms^{-1}$ from a pistol of mass 1.5 kg. Calculate the recoil velocity of the pistol.
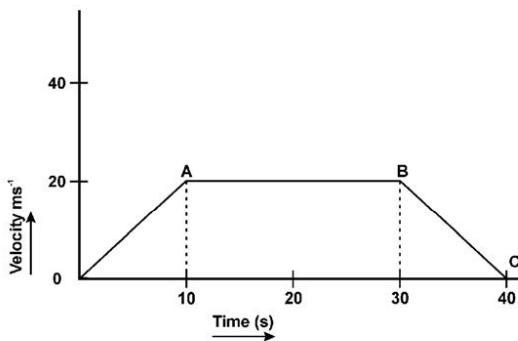
23. The velocity time graph for an object is shown in the following figure.
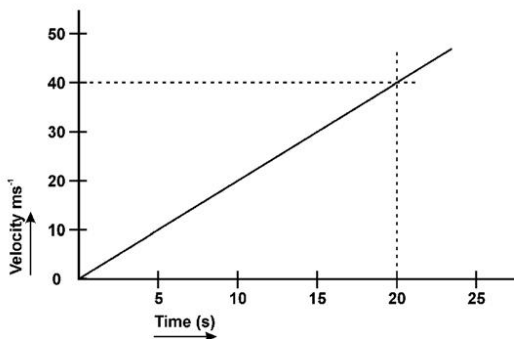
(i)   State the kind of motion that the above graph represents.

(ii)   What does the slope of the graph represent?

(iii)   What does the area under the graph represent?

(iv)   Calculate the distance travelled by the object in 15s.

OR

The velocity time graph of a body is given as follows-

(i)   State the kind of motion represented by OA; AB.

(ii)   What is the velocity of the body after 10s and after 40s?

(iii)   Calculate the retardaton of the body.

(iv)   Calculate the distance covered by the body between 10th and 30th second.

24. How can crop variety improvement methods come to the rescue of farmers facing repeated crop failures? Describe three factors for which they could do crop improvement.

Which is the most common method of obtaining improved variety of crops? Explain briefly.

OR

A poultry farmer wants to increase his broiler production. Explain three management practices he must follow to enhance the yield.

In what way is the daily food requirement of broilers different from those of egg layers?

SECTION B

25. Four students prepared mixtures in water by taking sugar, sand, chalk power and starch respectively, in four different test tubes. After stirring, the mixture that appeared clear and transparent was that of

a) starch and water

b) chalk powder and water

c) sand and water

d) sugar and water

26. Rohit mixed starch with water, boiled the mixture well and stirred it. He observed that -

a) starch floats on the surface of water

b) starch settles down at the bottom

c) starch forms a translucent mixture

d) starch forms a transparent mixture

27. You are provided with a mixture of iron filings and sulphur powder. When you add carbon-di-sulphide to the mixture, you would observe

a) iron particles dissolve and the solution turns black

b) sulphur powder dissolves and the solution turns colourless

c) sulphur powder dissolves and the solution turns yellow

d) iron particles dissolve and the solution turns grey

28. A strip of Magnesium metal is burnt in the flame. It is observed that

    a) a yellow light appears

    b) a white dazzling light appears

    c) magnesium starts melting

    d) lot of black smoke is produced

29. For determining the melting point of ice, the thermometer should be kept-

    a) with its bulb in the ice cubes

    b) in contact with the inner wall of the beaker

    c) a little above the ice cubes

    d) in touch with the beaker from outside

30. A student takes some water in a beaker and heats it over a flame for determining its boiling point. He keeps on taking its temperature reading. He observes that the temperature of the water

    a) keeps on increasing regularly

    b) keeps on increasing irregularly

    c) first increases slowly, then decreases rapidly and eventually becomes constant

    d) first increases gradually and then becomes constant

31. The colour of sodium chloride and ammonium chloride respectively is-

    a) yellow and white

    b) white and yellow

   c) both are white

    d) grey and yellow

32. In the laboratory, carbon-di-sulphide is used as a solvent to separate a mixture of iron filings and sulphur powder. What precaution has to be taken with carbon-di-sulphide?

   a) Keep away from water

   b) Keep away from flame

   c) Keep away from air

   d) Keep away from iron-sulphide

33. When iron nails are placed in copper-sulphate solution, after 10 minutes, its blue colour disappears and the solution appears

   a) reddish Brown

   b) blue

   c) light blue

   d) greenish

34. In an experiment to separate the components of a mixture of sand, common salt and ammonium chloride, the component which will be removed by filteration is

   a) sand

   b) common salt

   c) ammonium chloride

   d) none of these

35. To study the third law of motion, following sets of apparatus are available in a laboratory.

   set (i)   One spring balance, two weight boxes, inextensible thread, one pulley with a clamp, two pans of known mass.

   set (ii)   Two identical spring balances, one weight box, inextensible thread, one frictionless pulley with a clamp, one pan of known mass, a rigid support.

   set (iii) Four identical spring balances, two pulleys, inextensible thread, two clamps, two pans of known masses, two rigid support.

   set (iv)   Two identical spring balances, two weight boxes, two rigid supports, two pans of known masses, inextensible thread, two frictionless pulleys with clamps.

To perform the experiment successfully by using minimum apparatus, the best choice would be :

a)   set (i)

b)   set (ii)

c)   set (iii)

d)   set (iv)

36.   For doing the experiment, "to study the third law of motion using two spring balances", four students A,B,C and D set up their apparatus as shown below. The best set up is that of student -

a)   Student A   b)   Student B

c)   Student C   d)   Student D
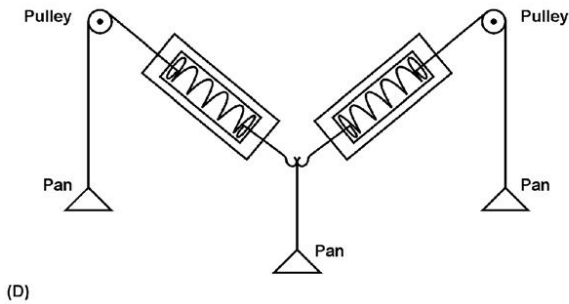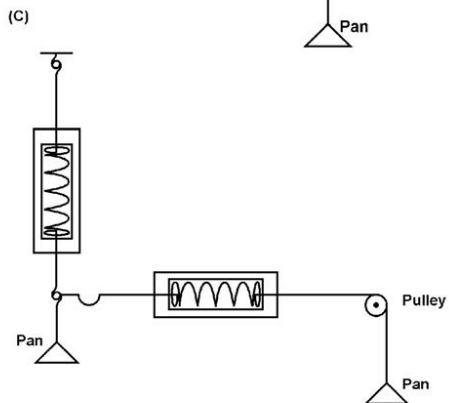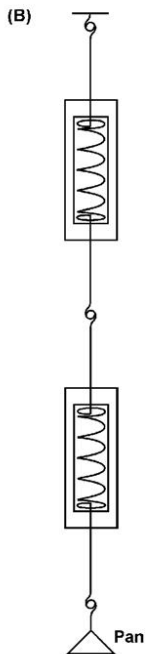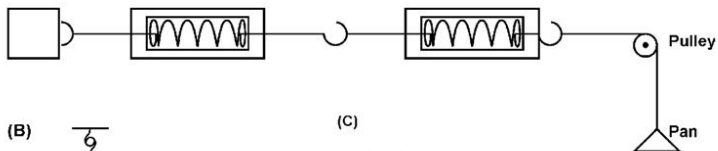
37. The appearance of magenta colour, on adding conc. HCl to a given sample of solution of dal confirms the presence of

   a) agremone oil in the dal

   b) Potassium dichromate in the dal

   c) saw dust in the dal

   d) Metanil yellow in the dal

38. The steps for conducting the starch test on the given sample of rice grains are

   a) crush the rice grains

   b) add water to the test tube

   c) add few drops of iodine

   d) boil the contents and filter

   The most appropriate order in which the steps should be followed are:

   a) ii, iii, i, iv

   b) ii, i, iii, iv

   c) iii, iv, i, ii

   d) i, ii, iv, iii

39. While preparing a temporary mount of the cheek cells, the reason behind staining the cells is

   a) to prevent the cells from drying quickly

   b) to preserve them

   c) to disinfect them

   d) to make the organelles clearly visible

40. Which of the observations noted by Arun about the parenchyma tissue is not correct?

   a) The cells are thin walled.

   b) Large cells placed together with intercellular spaces

c) The cells are loosely packed
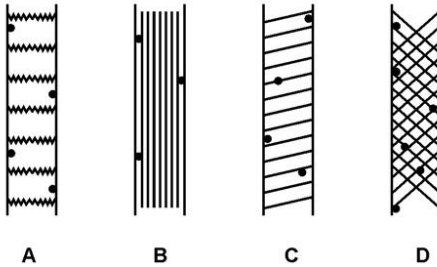
d) The cells are thick walled

41. The formula used to calculate the percentage of water absorbed by raisins is

$$\frac{W_2 - W_1}{W1} \times 100$$

W_2 in the formula refers to:

a) mass of raisins before absorption of water

b) mass of raisins after absorption of water

c) mass of water left in the beaker at the end

d) mass of water absorbed by the raisins

42. One of the following shows the correct diagramatic representation of a striped muscle fibre when seen under the low power of a microscope?

A   B   C   D

The correct answer is

a) A

b) B

c) C

d) D

MARKING SCHEAME
IX - SCIENCE

SECTION-A

1. Diffusion   1   1

2. Motion is accelerated   1   1

3. Chromoplast   1   1

4. (i) The composition of water is fixed.

     (H:0 = 1:8 by mass)

   (ii) Melting point and boiling point of water is fixed.

   (iii) Water cannot be separated into its constituent elements by physical methods.

   (iv) Water has entirely different properties from those of its constituent elements.

5. $W_e = 600$ N, $g_e = 10$ ms^{-2} ½x4   2

$$W_m = \frac{1}{6} W_e = \frac{1}{6} \times 600 \text{ N} = 100 \text{ N} \qquad 1$$

$$W = mg \qquad \therefore m_e = \frac{W_e}{g_e} = \frac{600N}{10 \text{ m/s}^2} = 60 \text{ kg} \qquad 1 \qquad 2$$

$\therefore$ Mass on moon is also = 60 kg.

$$\text{Alternatively, } M_m = \frac{W_m}{g_m} = \frac{100N}{10/6 \text{ ms}^{-2}} = 60 \text{ kg}$$

6. Similar feature :- Both have their own DNA & ribosome to make their own protein   1

Dissimilar feature :- Mitochondria is the site of cellular respiration and releases energy, while plastids with chlorophyll are centre for photosynthesis and store energy.   1   2

7. Fig 6.2 page 69 NCERT

                           (½ mark for each meristem labelled)   1½

Lateral meristem   ½   2

8. a) Observations

     (i) Sugar disappears in water.   1

     (ii) The volume of water does not increase.   1

   (b) Inference/interpretation:

     There is lot of space between water molecules into which the sugar molecules disappear.   1   3

9.

	Homogeneous Mixture	Heterogeneous Mixture
1.	Uniform composition throughout its mass	Does not have a uniform compostion throughout its mass
2.	No visible boundaries of separation between the constituents	Visible boundaries of separation between the constituents

<div align="right">(any one)   1</div>

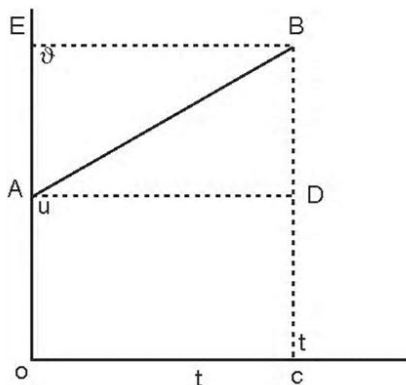(i) Homogeneous

(ii) Heterogeneous

(iii) Homogeneous

(iv) Homogeneous   ½x4=2   3

10.   1

Distance travelled by the object = Area of graph under the curve

         = area of trapez OABC

         = area of rectangle OADC + area of triangle ABD

         = OA x OC + ½ (AD x BD)

         = u x t + ½ (t x at)   1

∴   s   = ut + ½ at²   1   3

11. Law of inertia : An object remains in its state of rest or of uniform motion in a straight line until and unless acted upon by an external unbalanced force .   1

When a moving bus stops suddenly, the bus slows down but our body tends to remain in state of motion due to inertia of motion, Hence we get a forward jerk.   1

Sudden start of the bus brings motion to the bus as well as our feet but the rest of the body still has inertia of motion so we fall / get jerked in the backward direction. 1 3

12. $F \propto m_1 m_2$ and $F \propto \dfrac{1}{d^2}$

$$F = \dfrac{G\, m_1\, m_2}{d^2}$$

(i) The force of gravitation becomes $\dfrac{1}{9}^{th}$ the earlier value 1

(ii) The force of gravitation becomes 4 times its earlier value 1

(iii) The force of gravitation remains unchanged 1 3

13. Suppose an object of mass 'm' is moving along a straight line with an initial velocity 'u'. It is uniformly accelerated to velocity 'v' in time 't' by the application of a constant force 'F' throughout the time 't'.

According to the second law of motion,

Rate of change of momenturm is directly propotional to the applied force.

$\therefore$ $F \propto \dfrac{\text{Change in momenturm}}{\text{time taken}}$

$\propto \dfrac{p_2 - p_1}{t}$

$\propto \dfrac{mv - mu}{t}$

$\propto \dfrac{m(v-u)}{t}$

$\therefore$ $F = k\, m\, \dfrac{(v-u)}{t}$

$F = k\, ma$ 2

One unit of force is defined as the amount of force that produces an acceleration of $1 ms^{-2}$ in an object of 1 kg mass. 1 3

14. $u = 0$ $t = 0.5s$ $g = 10 ms^{-2}$

(i) $v = u + gt$ $= 0 + 10\ ms^{-2} \times 0.5\ s = 5\ ms^{-1}$ 1

(ii) Average speed $= \dfrac{u+v}{2} = \dfrac{(0+5)}{2} ms^{-1} = 2.5\ ms^{-1}$ 1

(iii) $h = ut + \dfrac{1}{2} gt^2$

$= 0 + \dfrac{1}{2} \times 10 ms^{-2} \times (0.5s)^2 = 1.25m$ 1   3

15. a) (i) Phloem unlike xylem allows movement of materials in both the directions   ½

     (ii) Phloem tranports food from leaves to other parts of the plant body.   ½

  b) Fig. 6.7 pg 73 NCERT   four Labels   ½ x 4   3

16. Striated muscle - Brings about all voluntary movements of the body   ½

Smooth muscle - helps in movement of food in alimentary canal   ½

Cardiac muscle - helps the heart to pump blood to all parts of the body   ½

Fig. 6.11, p77, NCERT book   diag. 2 labels   ½x2   3

17. Lysosomes

They are capable of breaking down all organic material and keep the cell clear by digesting worn out cell organelles.   1

They are membrane bound sacs filled with powerful digestive enzymes. When the cell is worn out and needs to be destroyed, the lysosomes burst and the enzymes digest the cell.   1   3

18. a) Dugwell - Water is collected from water bearing strata   ½

      Tubewell - taps water from deeper strata   ½

  b) Rain water harvesting and water shed management which involves building check dams.   1,1   3

19. a) Biotic factors - Insects/rodents/fungi/mites   (any one)   ½,½

      Abiotic factors - Inappropriate temperature/ Inappropriate moisture   ½,½

  b) Any two of the following measures-   ½,½

    - strict cleaning of produce before storage

    - proper sundrying and then drying it in shade

    - Fumigation

    - systematic management of warehouses   3

20. a)

PROPERTY	SOLUTION	SUSPENSION	COLLOID
Stability	Stable, i.e particles do not settle down on keeping	Not stable, i.e particles settle down on keeping	Stable, i.e, particles do not settle down on keeping
Filterability	Passes through the filter paper-particle size is very small.	Suspended particles do not pass through the filter paper - particle size is large	passes through the filter paper-particle size is small
Type of mixture	Homogenous	Heterogeneous	Heterogeneous but appears to be homogeneous

1x3=3

b) Concentration of a solution is the amount of the solute present in a given amount (mass or volume) of solution (or solvent)   1

Dissolve 10 g of glucose in 100g-10g = 90g of water   1   5

OR

a) Fig. 2.8 (b), p-21, NCERT Book. (Separation of dyes in blue blank ink)   1

Process : Chromatography   1

Principle : The coloured component that is more soluble in water rises faster and in this way, the colours of different dyes present in blue black ink get separated.   1

b) (i)   Chemical change

(ii)   Chemical change

(iii)   Physical change

(iv)   Chemical change   ½x4=2

21. a)   Similarity : Liquid state changes into the gaseous state.

Difference :

	EVAPORATION	BOILING
1.	It is a suface phenomenon, i.e, water molecules at the surface gain energy to change their state	It is a bulk phenomenon. All (bulk) the water molecules of water gain energy to change their state
2.	Can take place at all temperatures.	Take place at a fixed temperature. (or any other)

1+1=2

18

b) Four factors:

    (i)   surface area of the liquid exposed to atmosphere.

    (ii)   Temperature of the liquid

    (iii)   Humidity

    (iv)   Wind velocity

    (v)   Vapour pressure of the liquid   (any four)   ½x4=2

c) When ice cold water or crushed ice is taken in a tumbler, water droplets soon appear on the outer surface of the tumbler./ Anhydrous calcium chloride turns wet on keeping exposed to air. 1   5

OR

Characteristics	SOLID	LIQUID	GAS
Rigidity	Rigid -maintains hardness and shape	Fluid -flows easily	Fluid -capable of infinite expansion
Compressibility	Almost incompressible	Relatively incompressible	Highly compressible
Inter-particle forces of attraction	Strongest (keep the particles together)	Comparatively Weaker (but keep the particles within the bulk of liquid	Extremely weak -particles are free to move in all directions
Inter particle spaces	Nearly negligible	Intermediate	Very large
Kinetic energy of particles.	Very low	Low	High

22. Mometum of a body is defined as the product of its mass and velocity.   1

S.I unit - kilogram-meter per second ($kg\dfrac{m}{s}$)   1

Initial momentum = m w = 50kg x $4\dfrac{m}{s}$ = 200 kg m s^{-1} 1

Final momentum = m v =50kg x $8\dfrac{m}{s}$ = 400 kg m s^{-1} 1

Force = $\dfrac{mv - mu}{t}$ = $\dfrac{(400-200)}{8\,s}$ kg m s^{-1} = 25N   1   5

<div style="text-align:center">OR</div>

Law of conservation of momentum:-

The sum of momenta of the two objects before collision is equal to the sum of momenta after collision, provided there is no external unbalanced force acting on them   1

When a person falls on the hard floor, he is brought to rest in a very short interval of time so greater force is called into play

Whereas when he falls on a heap of sand, he is brought to rest in a longer time, so lesser force is called into play/ explanation in terms of momentum   1

Total momentum before firing (pistol & bullet) = 0   ½

Total momentum after firing (of pistol & bullet) is-

$$= 0.02 kg \times (100\ ms^{-1}) + 1.5 kg \times v\ ms^{-1} \qquad ½$$

$$= (2 + 1.5\ v)\ kg\ ms^{-1}$$
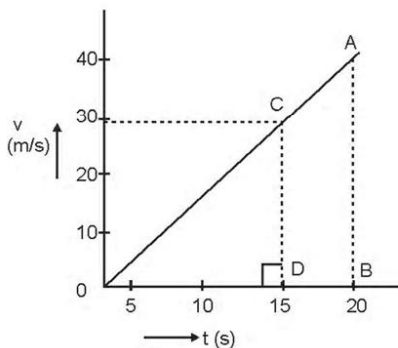
Total momenta after firing = total momenta before firing   ½

$2 + 1.5v = 0$

$1.5\ v = -2$

$\therefore\ v = -1.33\ m/s$

Negative sign indicates that the direction of recoil of pistol is opposite to that of bullet   1

23. (i)   Uniformly accelerated motion   1

    (ii)   Acceleration of the object   1

    (iii)   Distance travelled by the object   1

    (iv)

Distance = area of rt. triangle ODC

$$= \frac{1}{2}\ b \times h$$

$$= \frac{1}{2} \ (15 \ s) \ x \ 30 \ ms^{-1}$$

Distances   = 225 m   2   5

<div align="center">OR</div>

(i)   OA - uniform acceleration , AB zero acceleration / constant velocity   ½   ½

(ii)   20 ms⁻¹   ; zero / body comes to rest   ½   ½

(iii)   retardation = $\dfrac{(0-20)ms^{-1}}{(40-30)s}$ ms⁻¹ = -10ms⁻¹   1

(iv)   distance between 10th and 30th second = area of fig. shaded

$$= (30\text{-}10) \ s \ x \ 20 \ ms^{-1}$$

$$= 20s \ x \ 20 \ ms^{-1}$$

$$= 400 \ m$$ 2
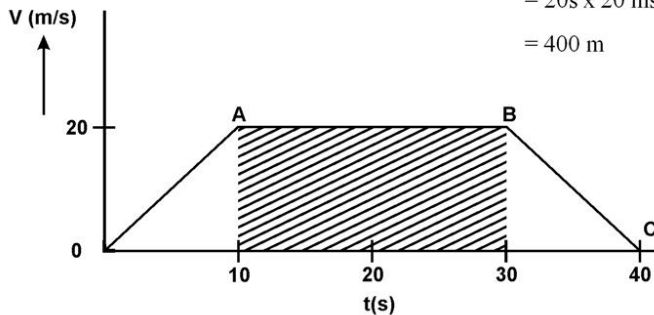
24.   (i)   develop biotic and abiotic resistance

      (ii)   wider adaptability

      (iii)   early and uniform maturity

              elaborate each of these factors   3

Most common method is Hybridisation, which involves crossing two varities having genes for desired characteristics and bringing them together into a new variety called hybrid   1   5

<div align="center">OR</div>

(i) Maintenace of temperature

(ii) provision of hygienic conditions in housing and poultry feed.

(iii) Prevention and control of diseases and pests   ½x3

The broiler's food must be rich in protein, fat, vitamin A and vitamin K, as the feed should help in good

growth rate, to develop more muscles and to maintain feathering and carcass quality　　　½x3

<u>SECTION-B</u>

25.	(d)
26.	(c)
27.	(c)
28.	(b)
29.	(a)
30.	(d)
31.	(c)
32.	(b)
33.	(d)
34.	(a)
35	(b)
36.	(a)
37.	(d)
38.	(d)
39.	(d)
40.	(d)
41.	(b)
42.	(a)