1. An athlete always runs some distance before taking a jump. Why? [1]

2. Name the term used for the process when gas directly formed from the solid. [1]

3. What does ATP stands for? [1]

4. What is meant by: [2]
(i) Free fall
(ii) Acceleration due to gravity?

5. A house wife churned full cream with a milk churner.
(i) What did she observe after churning the milk?
(ii)What could be the possible reason for the observation? [2]

6. What is the role of epidermis in plants? [2]

7. (a) Describe the structure of lysosomes in brief.
(b) What do chromosomes contain? [2]

8. Define mass of a body. [3]
Calculate the force required to produce an acceleration of $2ms^{-2}$ in a body of mass 10 kg.

9. A cube of side 5cm is immersed in water and then in saturated salt solution. In which case will it experience a greater buoyant force? If each side of the cube is reduced to half and then immersed in water, what will be the effect on the buoyant force experienced by the cube as compared to the first case for water? Give reason for each. [3]

10. List in tabular form any three differences between 'g' and 'G'. [3]

11. What is uniform circular motion. How is uniform circular motion regarded as an accelerated motion. Give example of such a motion. [3]

12. State the action and reaction in the following: [3]
(a) Moving rocket
(b) Firing of a bullet from a gun.
(c) A person walking on the floor.

13. (a) The smell of hot sizzling food reaches us several metres away. However, it is not so in case the food is cold. Explain.

(b) Why is sodium lighter while iron is heavier? [3]

14. (a) What do you understand by the solubility of a solute in a solution?

(b)Calculate the strength of a solution containing 5 g of glucose in 200 ml of the solution. [3]

15. What are the six aims and objectives of plant breeding? [3]

16. Explain any two patterns of growing crops. [3]

17. Identify the type of tissue in the following: [3]

Skin, bark of tree, bone.

18. Give reasons for the following: [3]

(a) Mitochondria are called "powerhouse" of the cell.
(b) Lysosomes are called the "suicidal bags".
(c) Chloroplasts are called the "kitchens" of the cell.

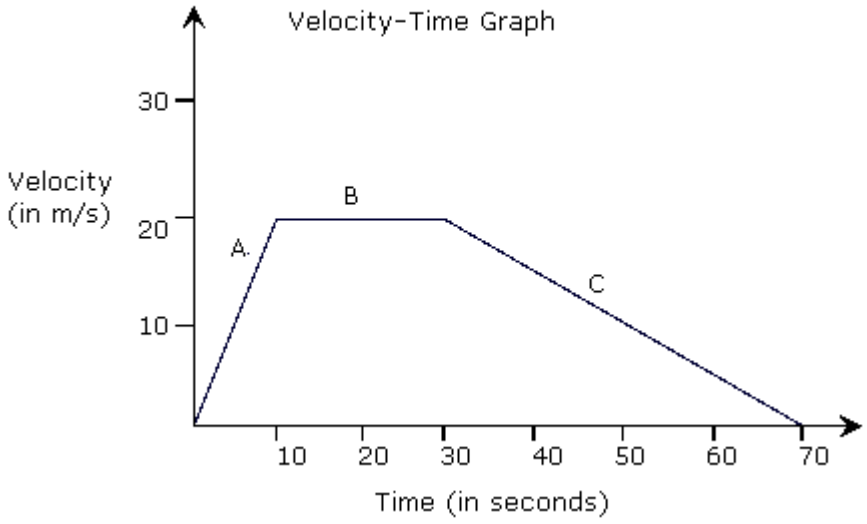
19. (a) What are the functions of areolar tissue.
(b) Name the muscle which gets fatigued very soon. [3]

20. (a) In a high jump event the athletes are made to fall on a sand bed or on a cushioned bed. Why? [5]
(b) Define momentum. State its S.I. unit.
(c) An object of mass 10 kg is accelerated uniformly from rest to a velocity of 8m/s in 6 s, calculate the final momentum of the object.

OR

(a) When a motor car makes a sharp turn at a high speed, we tend to get thrown to one side. Why?
(b) State Newton's 1st and 3rd law of motion.
(c) A force of 5N gives a body of mass 'm' an acceleration of $10 m/s^2$, calculate the mass of the body in grams.

21. (a) In the given graph, compare the acceleration the body undergoes in region A and C. [2]



(b) A car is moving with a speed of 10 m/s. When the brakes are applied, the car has a constant negative acceleration (slows down) of -2 m/s^2. What is its stopping distance? [3]

OR

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

(b) Suppose you are running around a football court 100 m long and 50 m wide. What will be more the distance covered by you or your displacement at the end of one round? [2]

22. (a) Why is water regarded as a compound? Give two reasons
(b) Describe an activity with a labelled diagram to separate the constituents from a mixture containing ammonium chloride, sand and iron filings. [5]

OR

(a) What types of mixtures are represented by the following?
(i) Carbon dioxide gas dissolved in water
(ii) Air containing suspended particles.
(iii) Soap bubbles formed by blowing air into soap solution.
(b) A mixture of ethyl alcohol and water is homogenous while that of oil and water is heterogeneous. Explain. [5]

23. (a) When sugar is dissolved in water, there is hardly an increase in volume. Which characteristic of matter is illustrated by this observation?

(b) How does our body maintain its temperature during summer?
(c) Butter is generally wrapped in wet cloth during summer if non refrigerator is available. Explain.
(d) What will happen when solid ammonium chloride is heated?
(e) When a solid start melting, its temperature does not rise till whole of it has melted explain [5]

OR

(a) How does pressure help in the liquification of a gas?
(b) What is meant by saying that latent heat of vaporisation of water is 22.5 x 10^5 J/Kg?
(c) A piece of chalk can be broken down into small particles on hammering but it is not possible to do so in case of a piece or bar of iron. Explain.
(d) A rubber band changes its shape when stretched .Can it be regarded as solid? [5]

24. (a) How are fish obtained?

(b) What are the advantages of composite fish farming?

(c) Why is irrigation necessary?

[5]

OR

(a) What is fumigation?

(b) What determines the quality of honey?

(c) List any two problems of composite fish farming.

[5]

Section B

25. If the actual mass of the body is 500 g & the spring balance reads 450 g, what could be the reason for the variation?
(a) zero error
(b) change in the value of g at a place
(c) Both the above reasons are possible

26. Same readings being shown in both the spring balances in the spring balance experiment provdies the proof of
(a) newton first law of motion
(b) newton second law of motion
(c) nexton third law of motion
(d) newton law of gravitation

Q27. A student was asked to add alum in equal amounts in three test tubes containing pond water, sandy water and distilled water. After shaking the water well, which is the correct observation out of the following?

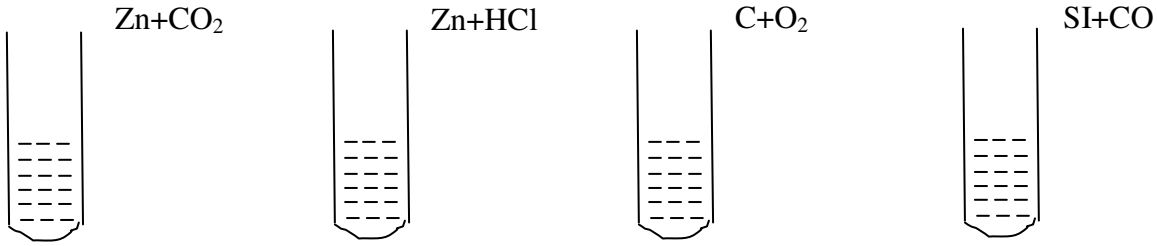
a) Pond water forms homogeneous solution with alum
b) Sandy water forms homogeneous solution with alum
c) Distilled water forms homogeneous solution with alum
d) All the above

Q28. There are four test tubes A, B, C and D half filled with water. A considerable amount of sugar, milk, egg white and common salt was added in each of the test tubes respectively and the contents of each test tube were stirred. True solution will be obtained in which of the following test tubes?

a) Only A
b) Only D
c) Both B and C
d) Both A and D

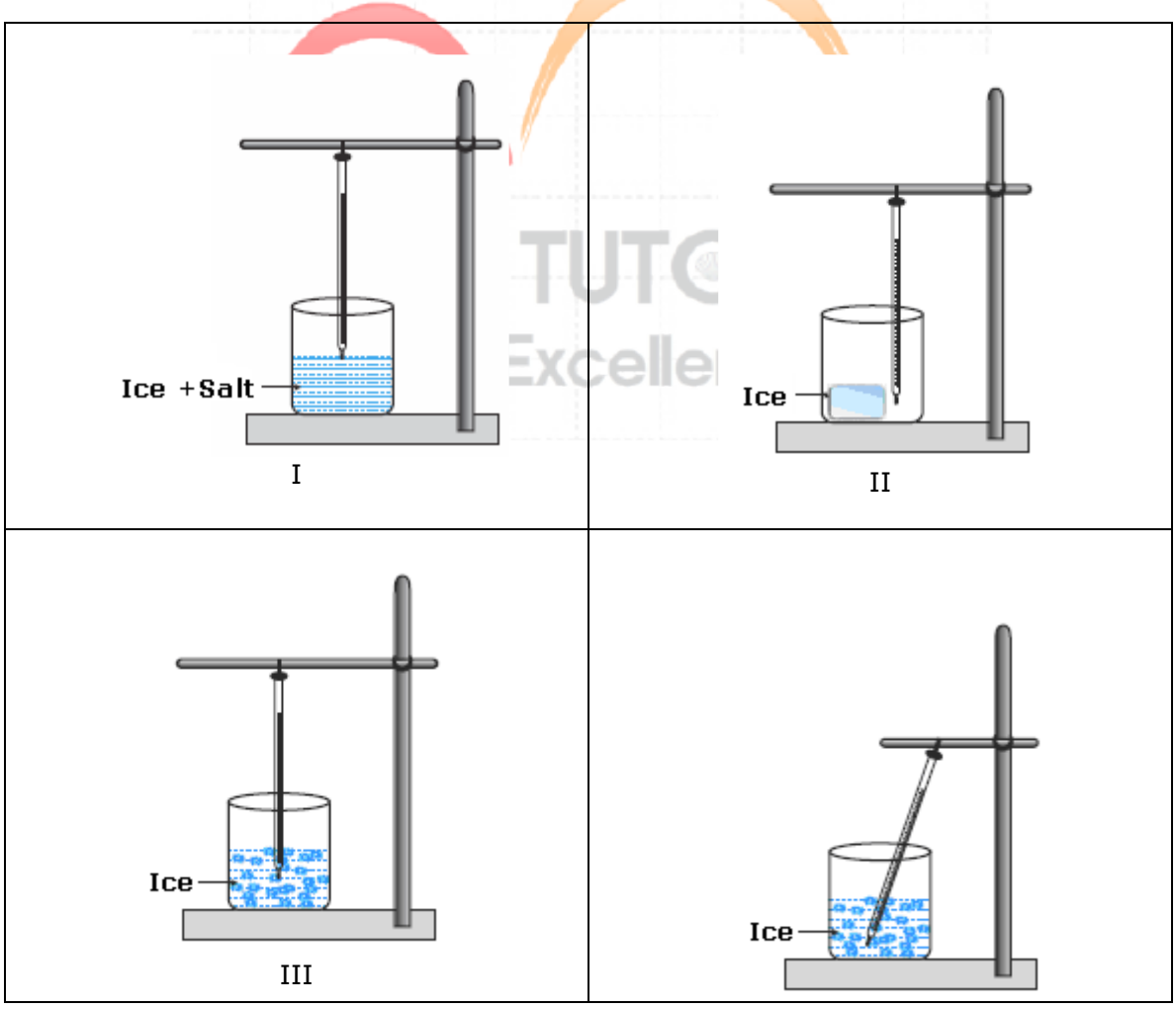
Q29. When we start heating a mixture of sulphur powder and iron fillings, we would observe that:
a) Sulphur start melting
b) Mixture become red hot
c) Mixture evaporates
d) Iron filings start melting

Q30. In which of the following experiment hydrogen gas will be evolved?



a) b) c) d)

Q31: Which one of the following is the correct set up to determine the melting point of ice?



a) I
b) II
c) III
d) IV

Q32. Identify the correct sequence for the procedure to determine the boiling point of water:

(i) Take about 70 – 100 mL of fresh distilled water in a boiling tube.
(ii) Heat the boiling tube gently by rotating the flame. Note the temperature when boiling of water starts. Continue to heat the water till the temperature becomes constant and water remains boiling. Note the constant temperature.
(iii) Fix a cork with two bores in the mouth of the boiling tube and clamp it with the stand. Introduce a thermometer in one bore of the rubber cork and a delivery tube in the second bore.
(iv) Place a beaker below the second end of the delivery tube.

Q33. The best apparatus used for evaporating liquids is:
a) Beaker
b) China dish
c) Test tube
d) Flask

Q34. The constituents substance in any ratio may be present in
a) Mixture
b) Solvent
c) Compound
d) Interstitial compound

Q35. Which type of reaction is heating of lead nitrate:
a) Displacement reaction
b) Photolytic decomposition reaction
c) Combination reaction
d) Thermal decomposition reaction

Q36. How would you separate sulphur from a mixture of iron and sulphur?
a) By filtration
b) By chromatography
c) By differential extraction
d) By magnet

37. Adulterated arhar dal becomes plain yellow in colour due to adulterant: [1]
(a) Metanil yellow
(b) Turmeric
(c) Itching yellow
(d) Malachite green

38. Following are five options for testing Metanil yellow in arhar dal: [1]
(i) Make powder of 5 gm of arhar dal,
(ii) Put dal powder in a test tube,
(iii) Add 2-4 drops of conc. HCl,
(iv) Filter the content and keep the filterate separately,
(v) Add 10 ml of water and well.
The correct sequence is:
(a) (i), (ii), (iii), (iv), (v)

(b) (i), (iv), (v), (ii), (iii)

(c) (i), (iii), (iv), (v), (ii)

(d) (i), (ii), (v), (iv), (iii)

39. Temporary mount of a living organism is made in: [1]
(a) Alcohol
(b) Acetone
(c) Glycerin
(d) Wax

40. Cheek cells can be collected by: [1]
(a) Gently peeling of the inner cheek epithelium with forceps
(b) Scarping the inside of the cheek with a toothpick
(c) Pulling out the inner layer of skin inside the cheek with a scalpel
(d) None of these

41. A permanent slide shown thin walled iso diametric cells with a large vacuole. The slide contains: [1]
(a) Collenchymas cells
(b) Sclerenchyma cells
(c) Parenchyma cells
(d) Nerve cells

42. Unbranched muscle fibres with characteristics station are: [1]
(a) Unstriated muscles fibres
(b) Striated muscle fibres
(c) Cardiac muscle fibres
(d) Involuntary muscle fibres

Solution of Sample paper

Section -A

1. Inertia of motion - to continue the state of motion so as to take a longer jump. [1]

2. Sublimation [1]

3. Adenosine tri phosphate. [1]

4. (a) Falling of objects because of gravitational force of attraction. [1+1]
(b) Acceleration acquired by a body due to gravitational force of the earth alone.

5. (i) Churning the milk is a centrifugation process. As a result, lighter particles of cream or butter will move upwards and collect at the top. Heavier milk will remain at the bottom [1]
(ii) The separation is based on the principle that lighter particles move upwards while denser particles downwards upon centrifugation. [1]

6. Epidermis acts as a protective tissue in plants and provides protection to underline tissue.
[1]
Epidermis helps in absorption, secretion, excretion, gaseous exchange and transpiration. It protects the entry of pathogens.
[1]
(Any two points)

7. (a) Lysosomes are membrane bound sacs filled with hydrolytic digestive enzymes.
[1]
(b) Chromosomes contain information for inheritance of characters/ traits from parents to next generation in the form of DNA molecules. [1]

8. Mass of a body is the amount of matter contained in it. [1]
F= ma= 10 kg$\times$2ms^{-1} = 20N [1+1]

9. (i) Greater buoyant force in saturated salt solution because density of salt solution is more than that of water. [$2\times1\frac{1}{2}=3$]
(ii) The smaller cube will experience lesser buoyant force as its volume is lesser than the initial.

10.

(i) 'g' is the symbol for gravitational acceleration.	(i) 'G' is the symbol for gravitational constant.
(ii) It varies from place to place.	(ii) It is a constant everywhere.
(iii) It is a vector quantity.	(iii) It is constant quantity.

[3×1= 3]

11. Uniform circular motion means a body moving in a circular path with uniform speed.
The speed remains constant but its direction is continuously changing, so the velocity of the body goes on changing.
Example: Moon revolving around the earth.

12. (a) Action- force by burning fuel [½×6]
Reaction- Rocket moving up
(b) Action- Force on the bullet
Reaction- Force on the bullet pushes the gun backwards.
(c) Action- Walking pers on pushes the earth backwards
Reaction- Earth in turn pushes the person forward

13. (a) When food is sizzling hot, it releases the vapours of its content. Since kinetic energy of the particles is very high in the vapour state, they can reach us even at a distance of several metres.
[1]
However, when food is cold, the vapours released will be comparatively less. Moreover, the kinetic energy of the particles is also very small. Under these conditions one has to come quite close in order to smell the content of the food.
[1]

(b) The density of sodium is lower than that of iron.
[1]

14. (a) The maximum amount of the solute that can be dissolved in 100g of the solvent to form a saturated solution at a given temperature is called as solubility of solute in a solution. [1]

(b) Mass of the glucose (solute) =5 g
Volume of solution = 200 ml
=0.2 L [1/2]

Now, $$\text{Strength of solution} = \frac{\text{mass of solute}}{\text{Volume of solution (in litres)}}$$ [1]

$$= 5/\ 0.2 = 25\ \text{g/L}$$ [1/2]

15. (i) High yield
(ii) Improved quality

(iii) Biotic and Abiotic resistance
(iv) Change in maturity duration
(v) Wider adaptability
(vi) Desirable agronomic characteristics
(vii) Development of novel varieties.
(Any six points)

[½x6=3]

16. (a) Mixed cropping pattern – It is the growing of two or more crops simultaneously on the same piece of land without any pattern. For example – wheat + gram, or wheat + mustard.

[1½]

(b) Inter cropping – It is growing of two or more crops simultaneously on the same field in definite pattern. For example – soyabean + maize.

[1½]

17. (a) Skin: Epithelial tissue (squamous epithelium)

[1]

(b) Bark of tree: Cork (protective tissue)

[1]

(c)Bone: Skeletal tissue (connective tissue)

[1]

18. (a) Mitochondria help in the oxidation of food and release energy in the form of ATP that is why it is called the powerhouse of the cell.

[1]

(b) Lysosomes contain digestive enzymes. When the cell gets damaged, lysosomes may burst and the enzymes digest their own cell. Therefore, lysosomes are called "suicide bags" of the cell.

[1]

(c) Plastids containing the pigment chlorophyll are known as chloroplast which helps to prepare food during photosynthesis. So, chloroplasts are called the "kitchens" of the cell.

[1]

19. (a) Functions of areolar tissue are:
(i) It fills the space inside the organs and thus forms a packing tissue between organs living in the body.

[1]

(ii) It supports many delicate organs in the body.

[1]

(iii) It helps in the repairs of tissues.
(Any Two points)

(b) Skeletal muscles.

[1]

20. (a) To reduce rate of change of momentum [1]
(b) Momentum is the product of mass and velocity. S.I. Unit is kgm/s [1+1]
(c) m= 10 kg [1+1]

$v = 8m/s \quad u = 0m/s$

$t = 6s$

$P_{final} = mv$

$= 10 \times 8$

$= 80\,kgm/s$

OR

(a) Due to inertia of motion (or) direction [1]

(b) An object remains in its state of rest (or) of uniform along a straight line unless it is acted upon by an external force. [1]

To every action there is an equal and opposite reaction. [1]

(c) F= 5 N [2]

$a = 10\,m/s^2$

$m = \frac{F}{a} = \frac{5}{10} = 0.5\,kg$

$m = 500g$

21. (a) The acceleration in region C is less as compared to region A because the slope is less steep in A than in C. [2]
The acceleration in C is negative because the slope is negative. That is, the body during C is retarding. The acceleration in A is positive,that is, the body is accelerating.

(b) Using, a = (v-u) /t
to see how long it takes the car to stop.
$a = -2\ m/s^2$
v = 0
u = 10 m/s [1]
t = (v-u) / a
t = (0 - 10)/ -2
t = 10/ 2
t = 5 seconds.
The car has constant acceleration,
so the average velocity = (initial velocity + final velocity) / 2 [1]
= (10 + 0)/2
= 5 m/s.
Since velocity = distance/ time
distance = velocity x time
distance = 5 x 5
= 25 m. [1]

OR

(a) Distance covered by the ball, s = 20 m
Acceleration, $a = 10\ m/s^2$

$u = 0 m/s$

Now, as per the 3rd equation of motion,

$v^2 = u^2 + 2as$

Hence, $v^2 = 0 + 2 \times 10 \times 20$

Or, $v = \sqrt{400} = 20$ m/s [1.5]

Now, as per the 1st equation of motion,

$v = u + at$

Or, $t = (v - u) / a$

Or, $t = (20 - 0) / 10$

Or, $t = 2$ s

Hence the ball strikes the ground after 2 s with a velocity of 20 m/s. [1.5]

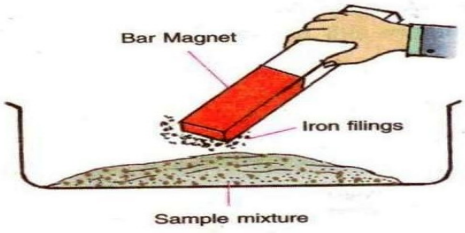
(b) Distance covered = (2x100) + (2x50) = 300 m.
Displacement = Zero, as the initial and final position.
Thus distance is more as compared to displacement. [2]

Q22. (a)Water is regarded as a compound due to the following reasons:-

(i) Water cannot be separated into its constituents, hydrogen and oxygen by physical methods. This conversion can be carried out by passing electricity. [1]

(ii) Water shows the properties of a compound i.e. water are altogether different than those of its constituents, hydrogen and oxygen. [1]

(b) Place the mixture on a paper or Petri dish. Move a magnet over it. Iron filings will get attached to the magnet. Scrap off iron filings from the magnet and collect them separately. Transfer the remaining mixture to a china dish and subject it to the sublimation process. Ammonium chloride will form the sublimate while sand will be left as residue in the dish. [2]



[1]

OR

(i) Homogeneous mixture [1]

(ii) Heterogeneous mixture [1]

(iii) Heterogeneous mixture [1]

(b) Ethyl alcohol combines with water to form a single phase only and there is no boundary of separation between alcohol and water. Therefore, the mixture is homogeneous in nature.

[1]

Oil and water also combine to form a liquid mixture only. However, there is a boundary of separation between the two which means that oil and water form separate layers. Therefore the mixture of the two is heterogeneous.

[1]

23. (a) This is because of the presence of interparticle spaces or empty spaces. Particles or molecules of water can fill the empty spaces in the particles or molecules of sugar and vice versa. That is why there is hardly any change in volume as a result of dissolution of sugar in water. [1]

(b) During summer, water from the body gets evaporated. In the process water takes heat energy equal to latent heat of vapourisation from the body leaving the body cool.

[1]

(c) In summer, the weather is quite hot, as a result water present in the wet cloth is readily evaporate. Since cooling is caused during evaporation, the temperature of butter will get lowered. This will check the rancidity of butter.

[1]

(d) It will directly change to the vapour state without passing through the liquid state.

[1]

(e) The heat energy which is now being supplied is used up to bring a change in physical state only. [1]

OR

(a)Increase in pressure help in the liquification of a gas.The particles or molecules of a gas come closer and closer as the pressure is being increased gradually. They ultimately condense and as a result, the gas liquefies or changes into the liquid state. [1]

(b) This means that when one kg of water at its boiling point temperature changes into steam, 22.5×10^5 J of heat is absorbed. [1]

(c) Chalk is a porous material and the attractive forces among the particles in the chalk are weak. Therefore it can be broken down into small particles on hammering. [1]

However no such pores are present in the pieces of iron. This means that the constituent particles are very closely packed in iron and the attractive forces are quite strong. Therefore it may not be possible to break the piece of iron into fine particles upon hammering [1]

(d) Yes, it can still regarded as solid .There are certain special cases where a solid undergoes a change in shape on applying pressure. When the pressure is released, it regains its original shape. [1]

24. (a) There are two ways of obtaining fish. They are:

(i) From natural resources, which is called capture fishing.

[1]

(ii) The other way is by fish farming, called culture fishery.

[1]

(b) Advantages of Composite fish farming:

(i) Different types of fish can be cultured along with a crop without causing damage to either of them.

[1]

(ii) It requires less feeding as fish feed on the waste of main crop.

[1]

(c) Irrigation is necessary because plants take up nutrients in liquid form.

[1]

OR

(a) Fumigation is a method in which the insecticides solution is converted into fumes, to kill insects.

[1]

(b) The quality of honey depends upon:

(i) The pasturage i.e. the kinds of flowers available.

[1]

(ii) Apiary location.

[1]

(c) The problems with composite fish farming are:

(i) Many of the fish breed only during monsoon.

[1]

(ii) Lack of availability of good quality seed.

[1]

SECTION - B

25. (c) [1]

26. (c) [1]

27. (c) [1]

28. (d) [1]

29. (a) [1]

30. (b) [1]

31. (c) [1]

32. (a) [1]

33. (b) [1]

34. (a) [1]

35. (d) [1]

36. (d)

37. (a) [1]

38. (d) [1]

39. (c) [1]

40. (b) [1]

41. (c) [1]

42. (b) [1]