Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Section A

1. Which of the following statements is not true? **[1]**

   A. motion is always uniform

   B. motion is a change of position

   C. motion can be described in terms of displacement

   D. motion can be uniform or non-uniform

   a) (B) b) (A)

   c) (D) d) (C)

2. Ribosomes are made up of _____. **[1]**

   a) Both RNA and Proteins b) RNA

   c) Lipoprotein d) Proteins

3. Internal parasites of cattle like fluke, damage **[1]**

   a) intestine b) liver

   c) brain d) stomach

4. Which among the following helps to increase the diameter or girth of plant organs like stem? **[1]**

   a) Secondary meristem b) Lateral meristem

   c) Both Lateral meristem and d) Apical meristem

Secondary meristem

5. Match the following with the correct response: **[1]**

(a) Genes	(i) Gases
(b) Diffusion	(ii) Loss of water by plant cells
(c) Osmosis	(iii) Movement of water molecular
(d) Plasmolysis	(iv) Hereditary units

a) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

b) (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)

c) (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)

d) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)

6. When the liquid starts boiling, the further heat energy which is supplied **[1]**

a) is absorbed as latent heat of vaporization by the liquid

b) is lost to the surrounding as such

c) Increases the temperature of the liquid.

d) increases the K.E of the particle in the liquid

7. Smooth muscle fibres are **[1]**

a) cylindrical, branched, multinucleate, striated and voluntary

b) cylindrical, unbranched, uninucleate, non-striated and involuntary

c) spindle-shaped, unbranched, uninucleate, non-striated and involuntary

d) cylindrical, unbranched, uninucleate, non-striated and voluntary

8. One mole of N_2 is equal to _____. **[1]**

a) 14 g of Nitrogen

b) 20 grams of Nitrogen

c) None of these

d) 6.022×10^{23} N_2 molecules

9. The atmosphere is held to the earth by **[1]**

a) wind

b) clouds

c) earth's magnetic field

d) gravity

10. Which of the following is the characteristic of distance travelled by an object? **[1]**

a) It has only magnitude and no specific direction

b) It has a magnitude as well as specific direction

c) It can be zero

d) The distance travelled by an

object is less than the magnitude of the displacement of the object.

11. Which of the following statements is not true about an atom? **[1]**

a) Atoms aggregate in large numbers to form the matter that we can see, feel or touch

b) Atoms are always neutral in nature

c) Atoms are the basic units from which molecules and ions are formed

d) Atoms are not able to exist independently

12. A nail is inserted in the trunk of a tree at a height of 1 metre from the ground level. After 3 years the nail will **[1]**

a) move downloads

b) remain at the same position

c) move sideways

d) move upwards

13. Which cell organelle plays a crucial role in detoxifying many poison and drugs in a cell? **[1]**

a) Lysosomes

b) Vacules

c) Smooth endoplasmic reticulum

d) Golgi apparatus

14. What is the formula of calcium phosphide? **[1]**

a) CaP

b) $Ca_3(PO_4)_2$

c) $CaCl_2$

d) Ca_3P_2

15. A mixture of sulphur and carbon disulphide is **[1]**

a) heterogeneous and shows Tyndall effect

b) heterogeneous and does not show Tyndall effect

c) homogeneous and shows Tyndall effect

d) homogeneous and does not show Tyndall effect

16. The science of growing vegetables, fruits and ornamental plants is called- **[1]**

a) Horticulture

b) Animal Husbandry

c) Floriculture

d) Agriculture

17. **Assertion (A):** At normal pressure (1 atm) the boiling point of water is 100^oC or 373.15 K. **[1]**
Reason (R): As the pressure increases, boiling point of water also increases.

a) Both A and R are true and R is

b) Both A and R are true but R is

the correct explanation of A.

not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

18. **Assertion (A):** The speed or velocity of a car running on a crowded city, road changes continuously. **[1]**
Reason (R): The movement of a car on a crowded city road is an example of non-uniform acceleration.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

19. **Assertion (A):** A German scientist, E. Goldstein in 1886, modified the discharge tube and passed an electric current through it. **[1]**
Reason (R): He found that the positively charged rays were emitted from the cathode in the discharge tube.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** Ciliated epithelium helps in the movement of particles. **[1]**
Reason (R): Cilia help in movement.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section B

21. A battery lights a bulb. Describe the energy changes involved in the process? **[2]**

OR

If a solid of the same density as that of a liquid is placed in it, what will happen to the solid?

22. Is there any similarity in materials? **[2]**

23. Why is it not proper to regard the gaseous state of ammonia as vapours? **[2]**

24. The frequency of a source of sound is 100 Hz. How many times does it vibrate in a minute? **[2]**

25. Na^+ has completely filled K and L shells. Explain. **[2]**

26. Derive the unit of force using the second law of motion. A force of 5 N produces an acceleration of 8 ms^{-2} on a mass 'm_1' and an acceleration of 24 ms^{-2} on a mass' m_2'. What acceleration would the same force provide if both the masses are tied together? **[2]**

OR

Which would require a greater force,accelerating a 2 kg mass at 5 ms^{-2} or a 4 kg mass at 2 ms^{-2}?.

Section C

27. What is the basic difference between the isotopes of an element? **[3]**

28. Kanika carried out an experiment on determination of speed of sound in air using resonance tube apparatus and obtained absurd results. She should **[3]**

a. record the result as such.

b. manipulate the result and report the answer nearer to actual value of velocity of sound in air.

c. copy the result obtained by another student.

d. report the result as such and discuss the matter with the teacher to find out the reasons for wrong results.

Answer the following questions based on the above information:

i. Which is the most appropriate option for Kanika?

ii. What values will Kanika be promoting through preferring this option?

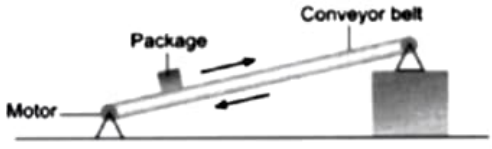
iii. Give one more example of promoting such values in real life situations.

29. A stone is thrown in a vertically upward direction with a velocity of 5 ms^{-1}. If the acceleration of the stone during its motion is 10 ms^{-2}in the downward direction, what will be the height attained by the stone and how much time will it take to reach there? **[3]**

OR

The driver of a car travelling along a straight road with a speed of 72 Km/h observes a signboard which give the speed limit to be 54 Km/h. The signboard is 70 m ahead, when the driver applies the brakes. Calculate the acceleration of the car which will cause the car to pass the signboard at the stated speed limit.

30. Figure shows a conveyor belt transporting a package to a raised platform. The belt is driven by a motor. **[3]**



i. State three types of energy, other than gravitational potential energy, into which the electrical energy supplied to the motor is converted.

ii. The mass of the package is 36 kg. Calculate the increase in the gravitational potential energy (p.e.) of the package when it is raised through a vertical height of 2.4 m.

iii. The package is raised through the vertical height of 2.4 m in 4.4 s. Calculate the power needed to raise the package.

iv. Assume that the power available to raise package is constant. A package of mass greater than 36 kg is raised through the same height. Suggest explain the effect of this increase in mass on the operation of the belt.

31. There would be no plant life if chloroplasts did not exist. Justify. **[3]**

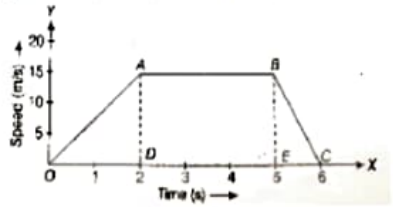
OR

Differentiate between chromatin and chromosome.

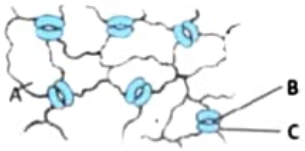
32. The speed-time graph of a car is given. The car weighs 1000 kg. **[3]**

i. What is the distance travelled by car in the first 2s?

ii. What is the braking force applied at the end of 5 s to bring the car to stop within one second?



33. Observe the given below diagram and answer the following questions: **[3]**



i. What does A represent in the given diagram? How does cell 'A' of root hairs cells help in water absorption?

ii. How does B in the given diagram help the plants?

iii. Out of A, B, and C cells in the above diagram, which cell helps in the closing and opening of the stomata? Write the name of the cell.

Section D

34. What are cell organelles? Write the names of different cell organelles. **[5]**

OR

Grass looks green, papaya appears yellow. Which cell organelle is responsible for this?

35. A car falls off a ledge and drops to the ground in 0.5 s. Let g = 10 ms^{-2} (for simplifying the calculations). **[5]**

i. What is its speed on striking the ground?

ii. What is its average speed during the 0.5 s?

iii. How high is the ledge from the ground?

OR

What is the magnitude of the gravitational force between the earth and a 1 kg object on its surface? (Mass of the earth is 6×10^{24} kg and radius of the earth is6.4×10^{6} m).

36. i. 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. **[5]**

ii. Identify, the physical and chemical changes from the following.

a. Burning of magnesium in air.

b. Tarnishing of silver spoon.

c. Sublimation of iodine.

d. Electrolysis of water.

Section E

37. **Read the text carefully and answer the questions:** **[4]**

The covering or protective tissues in the animal body are epithelial tissues. Epithelium covers most organs and cavities within the body. It also forms a barrier to keep different body systems separate. Epithelial tissue cells are tightly packed and form a continuous sheet. The skin, which protects the body, is also made of squamous epithelium. Skin epithelial cells are arranged in many layers to prevent wear and tear. This columnar epithelium facilitates movement across the epithelial barrier. In the respiratory tract, the columnar epithelial tissue also has cilia, which are hair-like projections on the outer surfaces of epithelial cells. Cuboidal epithelium forms the lining of kidney tubules.

(i) Identify the type of epithelial tissue shown in the following figure.

(ii) Which cell is present in the inner lining of the intestine?

OR

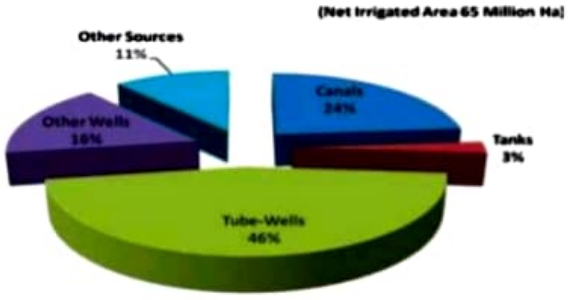
Is excretion is the main function of the cuboidal epithelium?

38. **Read the text carefully and answer the questions:** **[4]**

Irrigation

The process of supplying water to crop plants through human efforts by means of canals, wells, reservoirs, tube wells etc., is known as irrigation. Most agriculture in India is dependent on timely monsoons and sufficient rainfall spread through most of the growing season. However, the extra water required by crops is met

through irrigation.



(i) Which is the most common source of irrigation?

(ii) Mention the various sources of irrigation.

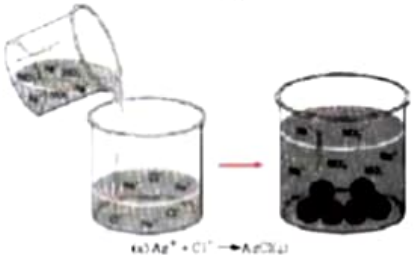
(iii) Which is the least use source of irrigation?

OR

What are the other sources of irrigation?

39. **Read the text carefully and answer the questions:** **[4]**

When a solution of silver nitrate is added to a solution of sodium chloride, the silver ions combine with the chloride ions to form a precipitate of silver chloride. Thus, Sodium chloride (NaCl) reacts with silver nitrate ($AgNO_3$) to produce silver chloride (AgCl) and sodium nitrate ($NaNO_3$).



(i) What mass of silver nitrate will react with 5.85 g of sodium chloride to produce 14.35 g of silver chloride and 8.5 g of sodium nitrate?

(ii) Calculate the number of oxygen atoms present in 1 gram of calcium carbonate.

(iii) Calculate the mass of 0.5 mole of nitrogen gas.

OR

Calculate the number of molecules in 50 g of NaCl.
[Atomic mass of Ca = 40 u, C = 12 u, O = 16 u, N = 14u, Na = 23u, Cl = 3 5.5u and Na = 6.022×10^{23} mol^{-1}]