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Candidates must write the Set No. on the title page of the OMR sheet
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**DAV PUBLIC SCHOOLS, ODISHA ZONE-1
PA-II EXAMINATION, 2021-22**

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| <ul style="list-style-type: none"> • Check that this question paper contains 11 printed pages. • Set number given on the right-hand side of the questions paper should be written on the OMR SHEET by the candidate. • Check that this question paper contains 60 questions. |
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CLASS – IX

SUBJECT: SCIENCE(086)

Time : 90 Minutes

Maximum Marks: 40

General instruction

1. The Question Paper contains three sections.
2. Section A has 24 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 12 questions. Attempt any 10 questions.
5. All questions carry equal marks.
6. There is no negative marking.

SECTION – A

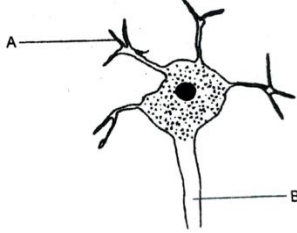
Section – A consists of 24 questions. Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

- Q1. Ali performed an experiment in which he put two different cells P and Q in pure water, P swelled up and burst eventually while cell Q became tight and firm but did not burst.**

Out of the following, the most appropriate inference is-

- A. Cell sap of cell P is isotonic to the pure water.
- B. Cell sap of cell Q is isotonic to pure water.
- C. Cell P has been obtained from a plant.
- D. Cell Q is a bacterium.

Q2. Label 'A' and 'B' correctly in the following diagram:



- A. A-nucleus, B-dendrite
- B. A-dendrite, B-axon
- C. A-axon, B-dendrite
- D. A-dendrite, B-nucleus

Q3. Besides nucleus DNA is also present in

- A. Ribosome
- B. Lysosomes
- C. Mitochondria
- D. Endoplasmic reticulum

Q4. Identify the statement that is not true.

- A. Cytoplasm contains jelly-like substance.
- B. Nucleus makes food for the plant.
- C. Chloroplast contains chlorophyll.
- D. Cytoplasm is the site where many cell activities take place.

Q5. Out of these options, identify the statements which are not functions of Ribosome.

- (i) It helps in manufacture of protein molecules.
- (ii) It helps in manufacture of enzymes.
- (iii) It helps in manufacture of hormones.
- (iv) It helps in manufacture of starch molecules.

- A. (i) and (ii)
- B. (i) and (iii)
- C. (iii) and (iv)
- D. (iv) and (i)

Q6. External protective tissues of plants are

- A. Cork and cortex.
- B. Cortex and epidermis.
- C. Epidermis and cork.
- D. Guard cell and parenchyma.

Q7. Find out the correct sentence:

- A. Enzymes packed in Lysosomes are made through RER (rough endoplasmic reticulum).
- B. Rough endoplasmic reticulum and smooth endoplasmic reticulum produce lipid and protein respectively.
- C. Endoplasmic reticulum is related with the destruction of plasma membrane.
- D. Nucleoid is present inside the nucleoplasm of eukaryotic nucleus.

Q8. The correct order of the parts of a nerve cell through which the nerve impulse is transmitted is

- A. Nerve endings, dendrites, axon and cell body.
- B. Cell body, axon, dendrites and nerve endings.
- C. Dendrites, nerve endings, cell body and axon.
- D. Dendrites, cell body, axon and nerve endings.

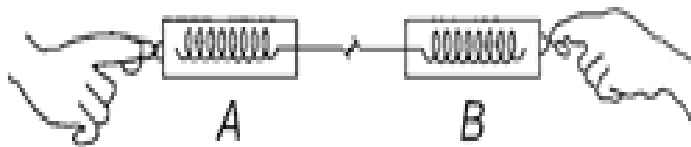
- Q9. State the function of cytoplasm that is present in the cell.**
- It plays a central role in cellular reproduction.
 - It is involved in the formation of lysosomes.
 - It helps in the synthesis of cell wall and cell membrane.
 - It holds the organelles of the cell in place.
- Q10. Out of the following tissues, the tissue that is present in kidneys**
- Squamous epithelium
 - Cuboidal epithelium
 - Columnar epithelium
 - Compound epithelium
- Q11. While doing work and running, you move your organs like hands, legs etc. Find out the correct statement, from the following options.**
- Smooth muscles contract and pull the ligament to move the bones.
 - Smooth muscles contract and pull the tendons to move the bones.
 - Skeletal muscles contract and pull the ligament to move the bones.
 - Skeletal muscles contract and pull the tendon to move the bones.
- Q12. Radha asked her friend the characteristic feature of sclerenchyma tissue. She has given explanation about the tissue that is given in the option**
- Living cells with hard, rigid secondary walls.
 - Dead cells with more thickness in their walls.
 - Dead cells with hard, rigid secondary walls with intercellular spaces.
 - Living-cells with uneven thickness in their walls.
- Q13. The particles of suspension**
- can't be seen with naked eye.
 - can't be seen with the help of powerful microscope.
 - can be seen with naked eye.
 - can't be seen with electron microscope.
- Q14. Which of the following statements is true?**
- Homogeneous mixtures can have variable composition.
 - Homogeneous mixtures have fixed composition.
 - Heterogeneous mixtures have fixed composition.
 - Salt solution is heterogeneous mixture.
- Q15. Which of the following is a homogeneous mixture?**
- Smoke
 - Alcohol-water mixture
 - Gun powder
 - Milk
- Q16. Which of the following is true about FeS?**
- It is attracted by magnet.
 - It is soluble in carbon disulphide.
 - It gives H₂S gas on reaction with dil. H₂SO₄.
 - It is yellow in colour.
- Q17. Which of the following is a chemical change?**
- Adding concentrated sulphuric acid to sugar.
 - Distillation of water.
 - Kneading of wheat flour.
 - Sublimation of ammonium chloride.

- Q18. A passenger in a moving train tosses a coin vertically upward which falls behind him. If the air resistance is zero, the motion of the train is**
- A. Accelerated B. uniform
C. retarded D. along circular tracks

- Q19. Area under a $v - t$ graph represents a physical quantity which has the unit**
- A. m^2 B. m C. m^3 D. $m s^{-1}$

- Q20. According to the third law of motion, action and reaction**
- A. always act on the same body.
B. always act on different bodies in opposite directions.
C. have same magnitude and directions.
D. act on either body at normal to each other.

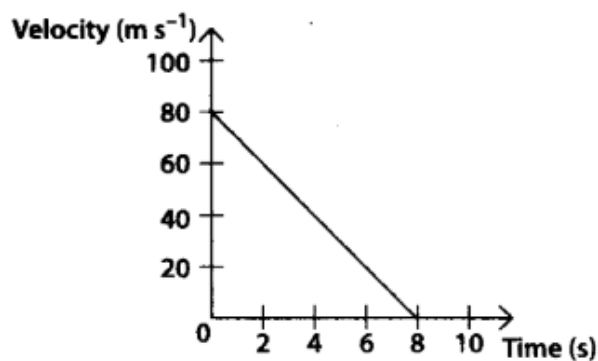
- Q21. Consider two spring balances hooked as shown in the figure. We pull them in opposite directions. If the reading shown by A is 1.5 N, the reading shown by B will be**



- A. 1.5 N B. 2.5 N C. 3.0 N D. Zero.

- Q22. $kg \cdot m/s^2$ is the unit of**
- A. Momentum B. Speed
C. Acceleration D. Force

- Q23. Velocity versus time graph of a ball of mass 50 g rolling on a concrete floor is shown in Fig. The frictional force of the floor on the ball is**



- A. 500 N B. 50N C. 5N D. -0.5N

- Q24. An athlete runs some distance before taking long jump because**
- A. He gains energy to take him through long distance.
B. It helps him to apply large force.
C. By running action and reaction forces increase.
D. By running the athlete gives himself larger inertia of motion.

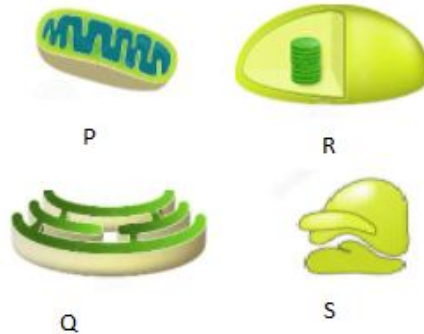
SECTION – B

Section - B consists of 24 questions (Sl. No.25 to 48). Attempt any 20 questions from this section. The first attempted 20 questions would be evaluated.

Q25. Muscles that is present in the eye helps the eyelids to blink when dust particles enter the eye. Identify the animal tissue that signals the muscles in the eyelid to blink.

- A. connective tissue
- B. epithelial tissue
- C. muscular tissue
- D. nervous tissue

Q26. Among the following cell organelles P, Q, R and S, find the odd one out.



- A. S, because the others are membrane bound cell organelles.
- B. P, because the others are involved in cell secretion.
- C. R, because the others are involved in protein storage.
- D. Q, because the others are involved in energy production.

Q27. Which of the following shows Tyndall effect?

- A. Common salt dissolved in water.
- B. Sugar dissolved in water.
- C. Iodine dissolved in alcohol.
- D. Milk.

Q28. What type colloidal system is fog?

- A. Gas in liquid
- B. Liquid in gas
- C. Liquid in liquid
- D. Solid in Gas

Q29. The solubility of CO₂ in water increases on

- A. Increasing the temperature.
- B. Increasing the pressure.
- C. Decreasing the pressure.
- D. Increasing the amount of water.

Q30. Colloidal solution of egg albumin in water is prepared by

- A. Adding egg albumin in hot water.
- B. Adding egg albumin in cold water.
- C. Adding egg albumin in cold water then adding salt.
- D. Adding egg albumin in water then adding acid.

Question No. 31 to 34 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- A. Both A and R are true and R is the correct explanation of A.
- B. Both A and R are true and R is not the correct explanation of A.
- C. A is true but R is false.
- D. A is False but R is true.

Q31. Assertion: Dust particle in air form aerosol.

Reason: Dust particles form dispersion medium and air is dispersed phase.

- A.
- B.
- C.
- D.

Q32. Assertion: Parenchyma tissue is non-living in nature.

Reason: Parenchyma cells have intercellular spaces.

- A.
- B.
- C.
- D.

Q33. Assertion: Mitochondria are semi-autonomous organelle.

Reason: Mitochondria generate energy.

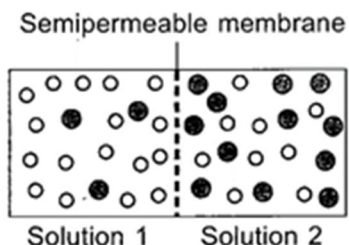
- A.
- B.
- C.
- D.

Q34. Assertion: The average speed of a body over a given interval of time is equal to the average velocity of the body in the same interval of time if a body moves in a straight line in one direction.

Reason: For the motion of a body in a straight line in one direction the distance is equal to the displacement.

- A.
- B.
- C.
- D.

Q35. Study the given figure carefully. The direction that indicates the net movement of water will take place is in the option-



[Key : ○ Water molecule; ● Solute molecule]

- A. From solution 1 to solution 2.
- B. From solution 2 to solution 1.
- C. Both (a) or (b)
- D. No movement will take place.

Q36 Take a clean glass slide and put few drops of water on it. Now place a complete Rheo leaf on water droplets and examine the cells of leaf under the high power of compound microscope. Put a few drops of concentrated salt/sugar solution on the mounted Rheo leaf on the glass slide. Wait for few minutes and again observe the leaf under the high power of microscope.

Find your observation after few minutes. The suitable interpretation will be in the option-

- A. Cell contents are separated from the cell wall.
- B. Cytoplasm along with plasma membrane has come to lie on one side of cell wall.
- C. A clear space is seen between the cell wall and protoplast of the cells.
- D. All of these.

Q37 A long tree has several branches. The tissue that helps in the sideways conduction of water in the branches is:

- A. Collenchyma tissue
- B. Xylem parenchyma
- C. Parenchyma
- D. Xylem vessels

Q38 A student conducts an experiment by placing an ice cube on the hands of four different individuals. The student recorded the time they took to respond towards the stimuli by dropping the ice cube. The possible conclusion from the experiment about the function of nervous tissue is

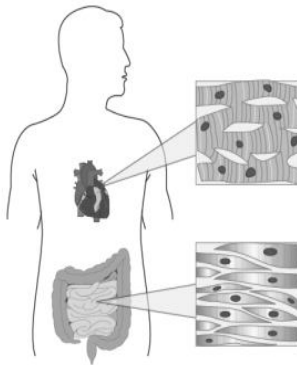
- A. nerve fibers pass signals very fast.
- B. nerve impulse depends on the length of the hand.
- C. response by nerve fibers depend on duration of the stimuli.
- D. different individuals have different types of nervous tissue.

Q39 In plants, cells in the leaves mainly make food for the plant.

Name the organelle, these cells have that enables them to make food.

- A. These cells have plastids with pigment chlorophyll that helps photosynthesize.
- B. These cells have mitochondria that provide ATP as energy to photosynthesize.
- C. These cells have colorless plastids that absorb sunlight to help plant photosynthesize.
- D. These cells have vacuoles that provide essential nutrients required for photosynthesis.

Q40 The image shows the structure of two types of muscles that are present in two different locations in the human body. Based on their location what can be concluded about their function



- A. both the muscles do not protect body organs.
- B. both the muscles show voluntary movements.
- C. both the muscles help in movement of body.
- D. both the muscles show involuntary movements.

Q41 The table lists about some functions performed by some cell structures.

<p>P. It separates the content of the cell from the surroundings.</p> <p>Q. It is a site where many cellular processes occur.</p> <p>R. It controls the process of cell division.</p> <p>S. It controls the movement of substances in and out of the cells.</p>

The option that shows the organelle correctly matched with the respective function is

- A. Cytoplasm- Q and S, nucleus- P, plasma membrane- R
- B. Cytoplasm- Q and R, nucleus- P, plasma membrane- S
- C. Cytoplasm- Q, nucleus- R, plasma membrane- S and P
- D. Cytoplasm- R, nucleus- Q, plasma membrane- S and P

Q42 A truck of mass 1200kg moving with velocity 20m/s gets stopped in 10 second by the application friction. The value of retarding force is

- A. 1200N
- B. 2400N
- C. 12000N
- D. 11760N

Q43 A number of discs, each momentum M kg-m/s, are striking a wall at the rate of n discs per minute. The force associated with these discs, in Newton will be

- A. $\frac{Mn}{60}$
- B. 60 M
- C. $\frac{M}{60n}$
- D. $\frac{n}{60 M}$

Q44 A force of 15 N acts separately on two bodies of masses 3 kg and 5 kg. The ratio of the acceleration produced on 5 kg mass to 3 kg mass will be

- A. 3 : 5
- B. 5 : 3
- C. 8 : 15
- D. 15 : 8

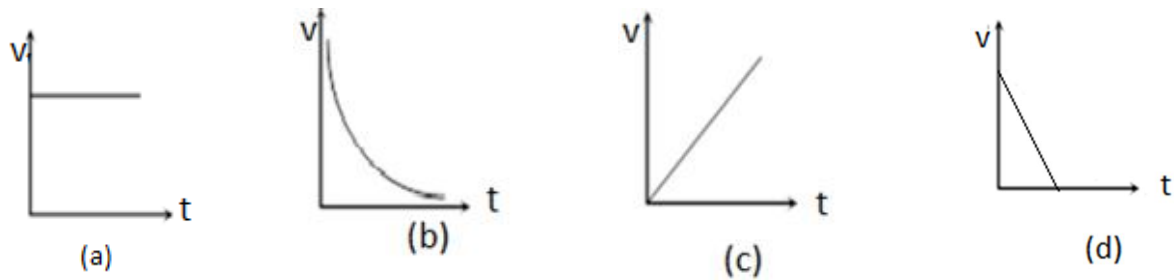
Q45 A body of mass 'M' collides against a wall with velocity 'V' and rebounds with same speed. The magnitude of change in momentum is

- A. Zero
- B. MV
- C. 2MV
- D. -MV

Q46 A block of mass 'M' is pulled with a force 'F' along a smooth horizontal surface with a rope of mass 'm'. The acceleration of the block will be

- A. $\frac{F}{M}$
- B. $\frac{F}{m}$
- C. $\frac{F}{M+m}$
- D. $\frac{F}{M-m}$

Q47 A ball is thrown vertically upwards. Which of the following graph represent the velocity-time graph of the ball during its flight (air resistance is neglected)?



- A. a B. b C. c D. d

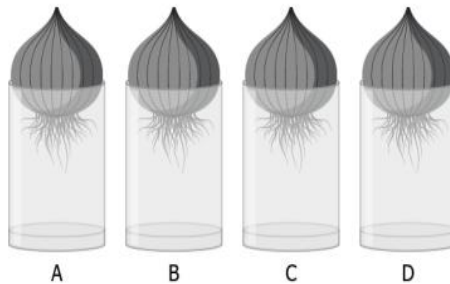
Q48 An object of mass 1.5 kg travelling in a straight line with a velocity of 5 m/s collides with a wooden block of mass 5 kg resting on the floor. This object sticks with wooden block after collision and then both move together in a straight line. The velocity of the combination of these objects after collision is

- A. 8.5 m/s B. 9.5 m/s C. 1.15m/s D. 1.5m/s

SECTION – C

Section- C consists of three Cases followed by questions. There are a total of 12 questions in this section. Attempt any 10 questions from this section. The first attempted 10 questions would be evaluated.

A student did an experiment to study the role of meristematic tissue in onion roots. For the experiment, an onion was kept in each of the four glasses that were filled with same amount of water.



The student measures the length of the roots in all the glasses on day 3. The student then cuts about a 1 cm of the onion roots in glass B, C, and D every next day and measures the length of the root on day 10. The table shows the result of the experiment.

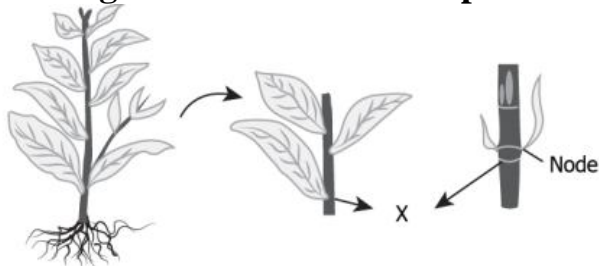
GLASS	ROOT LENGTH DAY 3(cm)	DAY ON WHICH ONION ROOT WAS CUT	LENGTH OF ROOT ON DAY10
A	2.0	-	6.0
B	2.0	DAY-4	1.0
C	2.0	DAY-5	1.0
D	2.0	DAY-6	1.0

Instruction: Read the above paragraph and answer Q.No- 49 to Q.No-52

Q49 Interpret the conclusion made by the student from the experiment

- A. Roots develop meristematic tissue again when cut.
- B. Roots grow faster after meristematic tissue is removed.
- C. Roots stops growing when meristematic tissue is removed.
- D. Roots with and without meristematic tissue had same growth.

Q50 The image shows the stem of a plant.



The type of meristematic tissue that is present at the labelled part 'X' is

- A. apical meristem
- B. intercalary meristem
- C. lateral meristem
- D. both apical and lateral meristem

Q51 A student observes that the tree near his house is growing more in width than height. The tissue that is responsible for this type of growth is

- A. apical
- B. intercalary
- C. lateral
- D. both apical and intercalary

Q52 Meristematic tissues in plants are:

- A. Localized and permanent.
- B. Not limited to certain regions.
- C. Localized and dividing cells.
- D. Growing in volume.

Depending upon the nature of the solute and the solvent there are nine types of solutions. A solution in which water acts as the solvent is called an aqueous solution while the one in which any other liquid acts as the solvent is called a non-aqueous solution. Depending upon the amount of solute present in a solution, it can be called a dilute, concentrated or saturated solution. The concentration of a solid in liquid solutions may be expressed either as mass-by-mass percentage or mass by volume percentage. However, concentration of very dilute solution is expressed in mass per million simply as ppm. On the other hand, concentration of liquid in liquid solution is expressed in volume-by-volume percentage. The maximum amount of solute in grams which can be dissolved in 100 grams of the solvent at a given temperature to form a saturated solution is called the solubility of the solute in that solvent at that particular temperature.

Instruction: Read the above paragraph and answer Q.No- 53 to Q.No-56

Q53 40 g of common salt are dissolved in 320 g of water, the mass-by-mass percentage of the solution is

- A. 11.1% B. 13.4% C. 15.2% D. 12.5%

Q54 The mass of glucose and mass of water required to make 250 g of 25% solution of glucose are

- A. 125 g of glucose and 250 g of water.
B. 62.5 g of glucose and 187.5 g of water.
C. 105 g of glucose and 150 g of water.
D. 65.5 g of glucose and 157 g of H₂O.

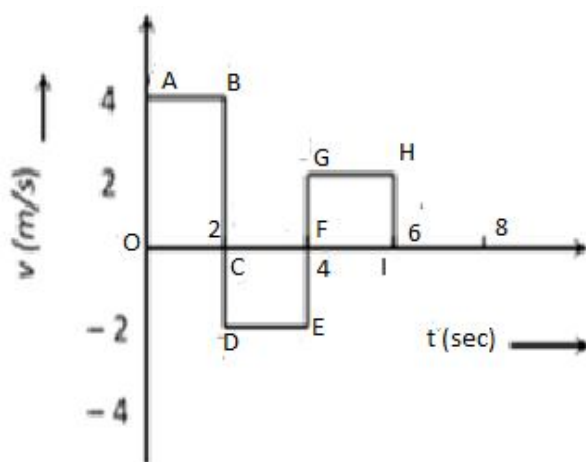
Q55 2.5 g of a solute are dissolved in 25 g of water to form a saturated solution at 298 K. The solubility of solute at this temperature is

- A. 15g B. 12.5g C. 10g D. 20g

Q56 A saturated solution on heating becomes

- A. Super saturated. B. Unsaturated.
C. Remains unaffected. D. Remain unaffected till 373K.

A student was asked to draw the velocity time graph of a moving body. The drawn velocity time graph is as follows.



Instruction:Analyze the above graph and answer Q.No- 57 to Q.No-60

Q57 The acceleration of the body in first two second is

- A. 4 m/s² B. -4 m/s² C. Zero D. 4 m/s

Q58 The distance covered by the body in first six second is

- A. 4m B. 8m C. 12m D. 16m

Q59 The displacement of the body in first six second is

- A. 4m B. 8m C. 12m D. 16m

Q60 The velocity of the body from 2 to 4 second is

- A. -2m/s B. 2m/s C. 4m/s D. Zero