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SET - A



INDIAN SCHOOL MUSCAT
MID TERM EXAMINATION
SCIENCE

CLASS: IX

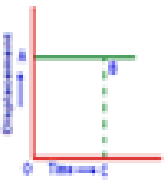
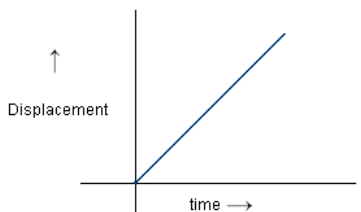
Sub. Code: 086

Time Allotted: 3 Hrs

MARKING SCHEME

01.10.2018

Max. Marks: 80

1.	(i) Acceleration (ii) displacement	1
2.	Gel	1
3.	<p>(i)</p>  <p>Displacement-time graph of an object at rest is a straight line</p> <p>(ii)</p> 	2
4.	<p>Mass $m = 1000\text{kg}$, $v = 50\text{m/s}$, $u = 10\text{m/s}$, $t = 20\text{ sec}$</p> $F = m (v-u) / t$ $= 1000 (50 - 10) / 20$ $= 1000 \times 40 / 20$ $= 2000\text{N}$	2
5.	<p>SI unit- Kelvin</p> $100^{\circ}\text{C} = 100 + 273 = 373\text{ K}$	2
6.	<p>A solution is said to be saturated if it has maximum solute dissolved in it.</p> <p>By heating and dilution</p>	2
7.	<p>(a) Diffusion (explain)</p> <p>(b) More surface area for evaporation</p>	2
8.	<p>1. What is the difference between plasma membrane and cell wall.</p>	2

	2. Name the process which amoeba obtains its food.	
9.	<p>1. Identify the type of tissue present in the following</p> <p>a. Bark of tree</p> <p>b. Husk of coconut</p> <p>2. Usually shrubs and herbs grow in open places and are exposed to forceful winds. But they do not break. Why?</p>	2
10.	How is chromatin network related to chromosomes?	2
11.	<p>1. What is the utility of tissues in multicellular organisms?</p> <p>2. Give two features of cardiac muscles.</p>	2
12.	<p>$F = ma$ $F = 100 \text{ N}$ and $m = 20 \text{ kg}$ $a = 100/20 = 5 \text{ m/s}^2$ Since, the force is acting constantly over the body, the acceleration is uniform; the equations of motion can be applied: $v = u + at$ Where $v = 100 \text{ m/sec}$, $a = 5 \text{ m/s}^2$ and $u = 0$ (rest). $t = v/a = 100/5 = 20 \text{ sec}$</p> <p style="text-align: center;">(OR)</p> <p>As initially both the gun and the bullet are at rest so the velocity of both bullet and gun is 0. Therefore, the initial momentum of gun and bullet = 0 Momentum gained by the bullet after firing, $p = mv = 0.01 \times 100 = 1 \text{ kg m s}^{-1}$ Recoil velocity of the gun Let the recoil velocity of the gun be V. From conservation of momentum, Final momentum of the system = initial momentum of the system $MV + mv = 0$ $\Rightarrow 0.5 \times V = -1$ $\Rightarrow V = -1/0.5 = -2 \text{ m/s}$</p>	3
13.	<p>(i) Inertia = 1:1</p> <p>(ii) momentum = 1:3</p> <p>(iii) force needed to stop first body is less than second body</p>	1+1+1
14.	<p>According to law of conservation of momentum</p> <p>When two or more bodies act upon each other their total momentum remains constant provided no external forces are acting.</p> <p>During the collision, let A impart an average force equal to F_{BA} on B and let B exert an average F_{AB} on A. We know that from third law of motion $F_{BA} = -F_{AB}$ (4)</p> $F_{BA} = m_2 \times a_2 = \frac{m_2(v_2 - u_2)}{t}$ $F_{AB} = m_1 \times a_1 = \frac{m_1(v_1 - u_1)}{t}$ <p>Putting above two in equation 4 we get</p> $\frac{m_2(v_2 - u_2)}{t} = -\frac{m_1(v_1 - u_1)}{t}$ <p>Here, momentum conservation</p>	3

	canceling t on both sides and rearranging the equation we get Now, $m_1u_1+m_2u_2$ represent the total momentum of particles A and B before collision and $m_1v_1+m_2v_2$ represents the total momentum of particles after collision. This means that Total momentum before collision=total momentum after collision $m_1u_1+m_2u_2=m_1v_1+m_2v_2$ is known as the law of conservation of momentum																									
15.	<p>i) Differences Between Speed and Velocity (Any two)</p> <table border="1"> <thead> <tr> <th>S.No.</th><th>SPEED</th><th>VELOCITY</th></tr> </thead> <tbody> <tr> <td>1.</td><td>It is defined as the rate of change of distance.</td><td>It is defined as the rate of change of displacement.</td></tr> <tr> <td>2.</td><td>It is a scalar quantity.</td><td>It is a vector quantity.</td></tr> <tr> <td>3.</td><td>It can never be negative or zero.</td><td>It can be negative, zero or positive.</td></tr> <tr> <td>4.</td><td>Speed is velocity without direction.</td><td>Velocity is directed speed.</td></tr> <tr> <td>5.</td><td>Speed may or may not be equal to velocity.</td><td>A body may possess different velocities but the same speed.</td></tr> <tr> <td>6.</td><td>Speed never decreases with time. For a moving body, it is never zero.</td><td>Velocity can decrease with time. For a moving body , it can be zero.</td></tr> <tr> <td>7.</td><td>Speed in SI is measured in ms^{-1}</td><td>Velocity in SI, is measured in ms^{-1}</td></tr> </tbody> </table> <p>(ii) Only when object is moving in same direction and in straight line.</p>	S.No.	SPEED	VELOCITY	1.	It is defined as the rate of change of distance.	It is defined as the rate of change of displacement.	2.	It is a scalar quantity.	It is a vector quantity.	3.	It can never be negative or zero.	It can be negative, zero or positive.	4.	Speed is velocity without direction.	Velocity is directed speed.	5.	Speed may or may not be equal to velocity.	A body may possess different velocities but the same speed.	6.	Speed never decreases with time. For a moving body, it is never zero.	Velocity can decrease with time. For a moving body , it can be zero.	7.	Speed in SI is measured in ms^{-1}	Velocity in SI, is measured in ms^{-1}	2+1
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16.	<p>Definition—Amount of solute dissolved in 100g of the solvent at a given temp: to form a saturated soln: Data to be written, mass of solution. Mass by mass % = mass of solute/mass of soln: * 100 = 60/540* 100 =11.1%</p> <p>OR</p> <p>Fog- liq in gas, Milk- liq in liq , Foam – gas in solid</p>	3																								
17.	(a) Sublimation (b) Dissolution / Diffusion (c) Centrifugation	3																								
18.	<p>Any two differences. Any eg: for solid in liq mixture</p>	3																								
19.	<p>A paralytic patient was unable to walk. ‘The family member of the patient took the outmost care of the patient.</p> <p>(a) Name two tissues responsible for the movement of a body. (b) Name the tissues present in brain and spine. (c) What value of the family members is seen in the above case?</p> <p>OR</p> <p>1. Give one word answer to the following a. Organelle containing chlorophyll</p>	3																								

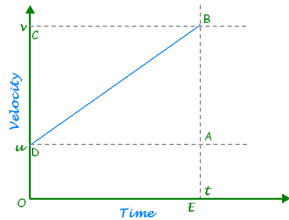
	b. Organelle with ribosome attached to its surface 2. Cell membrane is known as “selectively permeable membrane”. Give reason	
20.	1. Define the term diffusion . 2. What would happen to the life of a cell if there was no golgi apparatus?	3
21.	What will happen if <ol style="list-style-type: none"> 1. A cell contains higher water concentration than the surrounding medium. 2. A cell having lower water concentration than the surrounding medium. 3. A cell having same water concentration on both the sides. 	3
22.	<div data-bbox="196 527 524 772" data-label="Figure"> </div> <p>Let the initial velocity of the object = u</p> <p>Let the final velocity of the object = v</p> <p>Let the object is moving with uniform acceleration, a.</p> <hr/> <p>Let $OE = \text{time, } t$</p> <p>Now, from the graph,</p> <p>$BE = AB + AE$</p> <p>$\Rightarrow v = DC + OD$ (Since, $AB = DC$ and $AE = OD$)</p> <p>$\Rightarrow v = DC + u$ (Since, $OD = u$)</p> <p>$\Rightarrow v = DC + u$ ----- (i)</p> <p>Now, Acceleration (a) = $\frac{\text{Change in velocity}}{\text{Time taken}} = \frac{v - u}{t}$</p> <p>$\Rightarrow a = \frac{v - u}{t}$</p> <p>$\Rightarrow at = v - u \Rightarrow at = DC$ ----- (ii)</p> <p>$\Rightarrow v = u + at$</p> <p>(ii) Time taken to go = $\frac{100}{60} = \frac{5}{3} \text{ hr}$</p> <p>time taken to return = $\frac{100}{40} = \frac{5}{2} \text{ hr}$</p> <p>total distance = $(100 + 100) \text{ km} = 200 \text{ km}$</p> <p>total time taken = $(\frac{5}{3} + \frac{5}{2}) \text{ hr} = \frac{25}{6} \text{ hr}$</p> <p>average speed = $\frac{\text{total distance}}{\text{total time}}$</p> <p>$= \frac{200}{25/6}$</p>	3+2

$$=200 \times 6/25$$

$$=48\text{kmph}$$

(OR)

(i)



The distance covered by the object moving with uniform acceleration is given by the area of trapezium ABDOE

Therefore, Area of trapezium ABDOE

$$=1/2 \times (\text{sum of parallel sides}) \times \text{distance between parallel sides}$$

$$\Rightarrow \text{Distance (s)} = 1/2(\text{DO} + \text{BE}) \times \text{OE} = 1/2(\text{DO} + \text{BE}) \times \text{OE}$$

$$\Rightarrow s = 1/2(u + v) \times t \text{ ----(iii)}$$

$$\text{Now from equation (ii) } a = (v - u)/t$$

$$\therefore t = (v - u) / a \text{ ----(iv)}$$

After substituting the value of t from equation (iv) in equation (iii)

$$\Rightarrow 2as = (v + u)(v - u) \Rightarrow 2as = (v + u)(v - u)$$

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

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

$$(\text{ ii }) \quad s = ut + 1/2at^2$$

$$= 0 + 1/2 a \times 5 \times 5$$

$$100 = 1/2a \times 25$$

$$1/2a = 100 / 25$$

$$1/2a = 4$$

$$a = 4 \times 2$$

$$= 8 \text{ m/s}^2$$

23. a) Every object in the universe attracts every other object with a force which is proportional to the product of their masses and inversely proportional to the square of the distance between them. The force is along the line joining the centers of two objects.
Let two objects of masses M and m lie at a distance of d from each other. Let the force of attraction between two objects be F.
According to the universal law of gravitation,

1+2

	$F \propto Mm$ $F \propto 1/d^2$ <p>By combining above two equations, we get</p> $F \propto Mm / d^2$ $F = GMm / d^2$ <p>Where G is constant of proportionality known as universal law of gravitation.</p> <p>(b) (i) Force becomes doubled. (ii) Force increases by 4 times.</p>	1+1
24.	<p>Comparison</p> <p>Tyndall effect- Scattering of beam of light by colloidal particles</p> <p>OR</p> <p>1.(a) using Separation funnel (b) Evaporation</p> <p>2. Sublimation (explain) , labeled diagram</p>	5
25.	<p>(a) Any Three differences.</p> <p>(b) Temp: increases more rate of evaporation Humidity is more –rate of evaporation is less</p>	5
26.	<p>1. A group of students completed the project of finding the botanical names of all the trees present in the school campus. They prepared metal plates with names carved on it, to fix it on the plant trunks. Shreya was concerned that if the metal plate is fixed into tree many cells of the tree may get damaged. But the group members explained her that the outer layer of trunk does not have living cells and there won't be any damage to the tree.</p> <p>(a) What type of cells are present on the outer layer of the bark/tree trunk? (b) How does the cork act as a protective tissue? (c) What value of the group is seen in the above case?</p> <p>2. Why does epidermal tissue have no intercellular space?</p> <p>3. State any two functions of stomata.</p> <p style="text-align: center;">OR</p> <p>1. Name the tissues for the following:</p> <ol style="list-style-type: none"> Stores fat in animal body. Tissue that joins bone to bone. Covers the external surface of animal body. Tissue that joins bone to muscle <p>2. What is the function and location of stratified squamous epithelium?</p> <p>3. Draw a well labelled diagram of a typical neuron.</p>	5
27.	<p>1. Enumerate three differences between a prokaryotic and Eukaryotic cell.</p> <p>2. Draw a well labeled diagram of a prokaryotic cell.</p>	5
	End	