INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2022
086 SCIENCE
CLASS IX

MARKING SCHEME

TOTAL MARKS :80

| GENERAL INSTRUCTIONS:		
SECTION - A		
1.	momentum	1
2.	10	1
3.	Ball D,4kg	1
4.	Balanced	1
5.	2r	1
6.	acceleration	1
7.	b) Uniform circular motion	1
8.	solvent	1
9.	a molecule is two or more atoms connected by chemical bonds	1
10.	water	1
11.	a	1
12.	d	1
13.	Why the plasma membrane is called a selectively permeable membrane? The plasma membrane is called selectively permeable as it only allows specific molecules to pass.	1
14.	Name two structures that found in plant cells but not in animal cells. Cell Wall and Chloroplast.	1
15.	Which chemical deposited in the cell wall of sclerenchyma makes them thicker. Lignin.	1
16.	**Assertion:** Mitochondria are known as 'Powerhouse of the Cell'. **Reason**: The body uses energy which is usually found in the form of ATP's for making new chemical compounds and mechanical work of the body. Those ATP is stored in mitochondria. a) Both Assertion and Reason are correct and reason is the correct explanation for assertion.	1
17.	Physics (CBQ)	
17 i	Newton's second law	1
17 ii	Newton's third law	1
17 iii	Newton's first law	1
17 iv	Newton's third law	1
17 v	Newton's second law	1
18.	Physics (CBQ)	

18 i	B is 100 km ahead of A.	1
18 ii	speed of B = 150−100/2-0 =25Km/h	1
18 iii	A will catch B at point Q after 2hrs and at a distance of 150Km.	1
18 iv	speed of A= 150−0/2-0=75Km/h speed of B = 150−100/2-0 =25Km/h so the difference is 50km/hr	1
18 v	speed of both the trains is uniform as s-t graph makes a straight line.	1
19.	(i) a (ii) b (iii) a (iv) d (iv) c	
20.	Biology (CBQ)	
20 i	Who discovered the cell? a) Robert Hooke	1
20 ii	Who discovered the nucleus in the cell? b) Robert Brown	1
20 iii	Which of the following is the main constituent of cell wall? d) Cellulose	1
20 iv	A cell is placed in solution swells up. The solution is c) Hypotonic	1
20 v	The structural or functional unit of life is d) Cell	1
Section - B		

21.	ACCELERATION-
	   • Defined as change in velocity per unit time
	   • SI Unit m/s²
	VELOCITY-
	   • Defined as change in displacement per unit time
	   • SI Unit m/s
		2

22.	no more solute can be dissolved 1 1/2 at a given teperature 1/2	2
23.	chemical compounds are made up of element that are present in the fixed ratio by mass	2
24.	any two differences between physical change and chemical change (each difference one mark)	2
25.	Define aerenchyma. Mention its function in plants. Aerenchyma is a modified parenchymatous tissue containing air chambers between cells(1M) Function: These cells facilitate diffusion of gasses between the plant and its surroundings and provide buoyancy to aquatic plants (1M).	2
26.	Why are lysosomes known as suicide bags? Lysosomes are the organelles that have digestive enzymes. When lysosomes burst, the digestive enzymes released start digesting its own cells. That is why they are known as suicidal bags.	2
27.	Distinguish between plant cell and animal cell.	3

Plant cell	Animal cell
1. A plant cell is surrounded by a rigid cell wall.	1. An animal cell does not have a cell wall.

	2. Presence of a large vacuole is seen in plant cells.	2. Whereas there are very small vacuoles as compared to plant cells are seen in animal cells.	
	3. Larger in size.	3. Smaller in size.	
	4. Plant cells have plastids.	4. Animal cells do not have plastids.	
	5. Centrosomes are absent in plant cells	5. Animal cells have centrosomes.	
	6. Plant cells do not have cilia.	6. Animal cells have cilia.	
	7. Lysosomes are very rare in plant cells.	7. Animal cells have lysosomes.	

28.	a) An object at rest remains at rest, or if in motion, remains in motion at a constant velocity unless acted on by a net external force.(1 mark) b) u = 0,S = 400 m,t = 20 s ,m = 7000kg, S= ut+1/2at²(1 mark) □a=2m/s², F = 14000N (1 mark) Or a) When a person jumps out of the boat, he pushes the boat in the backward direction (action).According to newton's third law the boat also exerts an equal force(reaction) in the forward direction. Hence the boat moves backwards when he jumps out (2 marks) b) A one Newton force is defined as that force when acting on a body of mass 1 kg produces an acceleration of 1m/s2 in it.	3

29.	(i) the smallest partical of a chemical element that can exist (1)
	(ii) international union of puer and applied chemistry (1)
	(iii) 1: 8
	      3: 3x 8
	      3:24
	      required oxygen mass is 24 gram (1)
		3

30.	any three differences between true solution, colloidal, suspension.
	(each difference one mark)
	
	              or
	(i)a compound is a substance made up of two or more different chemical elements combined in a fixed ratio. (1)
	(ii)
	mas of common salt (solute)=40 g
	
	mass of water (soluted) =320 g
	
	mass of solution=320+40
	
	      =360 g
	concentration of solution= mass of solute/ mass of solution x100 (2)
	                  = 40 / 360 x 100
	
	      = 11.11%
		3

31.	What are meristematic tissues? Explain with the help of suitable diagram.	3

	Meristematic tissues are the tissues in which the cells divide continuously and help in increasing the length and girth of the plant (1M). According to their position in the plant, meristems are of three types: a) Apical Meristems - These are situated at the growing tip of the stems and roots and increase the height of the plant. b) Lateral Meristems - These are found beneath the bark and in vascular bundles of dicot roots and stems. These are responsible for the growth of cambium and hence increases the girth of the plant. c) Intercalary Meristems - They are located at the base of leaves or internodes or below the nodes. It increases the length of the plant (1M). Diagram (1M).	
32.	Write a short note on parenchyma. Parenchyma is round or oval-shaped cells having spaces between them and they are Simple tissues are tissues composed of cells that are structurally and functionally similar i.e. they are made up of same type of cells. It is present in the stem, leaves, flowers, fruits and seeds. Most of them contain leucoplast and store food. Chloroplasts containing parenchyma is named as chlorenchyma and performs photosynthesis. Parenchyma with large air spaces is named aerenchyma and is found in aquatic plants. Or Distinguish between xylem and phloem. Xylem and Phloem are two different types of vascular tissues. The main difference between the two is: Xylem is responsible for transporting water and minerals from roots to other parts of the plant, whereas phloem is responsible for transporting food and organic compounds from leaves to other plant parts.	3

33.
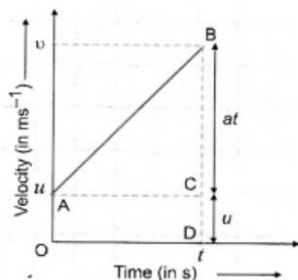
Answer:

From figure , we can find the distance travelled by a body during the period its velocity changes from u to v.

Distance travelled, S = Area under velocity-time graph
= Area of trapezium OABD
= Area of $\triangle$ ABC + Area of rectangle OACD

or $\qquad$ $S = \dfrac{1}{2} \times AC \times CB + OD \times OA$ $\qquad$ ...(i)

Here, $\qquad$ AC = OD = t,
$\qquad$ CB = DB − DC = $(v - u)$
and $\qquad$ OA = u
$\therefore$ eqn. (i) becomes

$\qquad$ $S = \dfrac{1}{2}(u + v)\, t$ $\qquad$ ...(ii)

We know $\qquad$ $v = u + at$

or $\qquad$ $at = v - u$ or $t = \left(\dfrac{v - u}{a}\right)$

Put this value of 't' in eqn. (ii), we get

$\qquad$ $S = \dfrac{1}{2}(v + u)\left(\dfrac{v - u}{a}\right)$

or $\qquad$ $2aS = (v + u)(v - u)$
$\qquad\qquad\quad = v^2 - u^2$ $\qquad$ $[\because A^2 - B^2 = (A + B)(A - B)]$
$\therefore$ $\qquad$ $v^2 - u^2 = 2aS,$ $\qquad$ ...(3)

MARK DISTRIBUTION-
- Graph – 1 mark
- Area of trapezium – 1 mark
- Substituting u,v and t in the formula -1 mark
- Substituting t = (v-u)/a – 1mark
- Deriving final equation – 1 mark

Or

a) If the velocity of an object changes by an equal amount in equal intervals of time, then the acceleration of the object is known as uniform acceleration. 1 mark
b) FIRST CASE
$\qquad$ u=0
$\qquad$ v=10 m/s
$\qquad$ t=40 s
$\qquad$ a=(v-u)/t (1 mark)
$\qquad$ □a = ¼=0.25 m/s² (1 mark)
$\qquad$ SECOND CASE
$\qquad$ u = 10 m/s
$\qquad$ v = 5 m/s

5

	$t = 10$ s $a=(v-u)/t$ (1 mark) ☐ $a = -5/10 = -0.5$ m/s² (1 mark)	

34.	(i) mass neither created not destroyed (2)
	(ii) six daltons postulates (3)
	each postulate half mark
	
	                or
	(i)
	
	Sodium + Ethanoic acid → Sodium + Carbon dioxide +
	carbonate ethanoate
	5.3 g + 6 g → 8.2 g + 2.2 g +
	             LHS RHS
	∴ 11.3 g = 11.3 g
	(Mass of reactant) (Mass of product)
	This shows that during a chemical reaction mass of reactant = mass of product
	(3)
	
	(ii) the relative number and kinds of atoms are constant in a given compound.
	(1)
	(iii) these particles are too small to see and cannot be created or destroyed in a chemical reaction (1)
		5

35.	Describe the structure of mitochondria with the help of neat labeled diagram. Mitochondria have a double wall membranous structure. The membranes are composed of phospholipids and protein. The space between the outer and inner membrane is known as periplastidial space. The outer membrane has special proteins known as porins. It is freely permeable to nutrient molecules, ions, energy molecules like the ATP and ADP molecules. It is 60 to 75 angstroms (Å) thick. The inner membrane folds inwards to form finger-like projection known as cristae which help to increase the surface area for absorption. The two membranes enclose a fluid which is known as matrix. It is a complex mixture of proteins and enzymes. These enzymes are important for the synthesis of ATP molecules. It has its own DNA which is mainly used for genetic modification. (3M) Diagram (2M) Or Draw a well labeled diagram of nucleus and explain its various parts. The nucleus is considered as the director or controller of the cell. The nucleus is a double membrane-bound organelle. The nuclear envelope consists of two membranes, an outer membrane, and an inner membrane. The nuclear membrane is perforated by apertures known as nuclear pores.	5

Nuclear membranes surround the cytoplasm of nucleus known as nucleoplasm. DNA is present in nucleoplasm in the form of chromatin. When the cell prepares to divide, the chromatin condenses and thickens into chromosomes.

Within the nucleus is present a spherical body known as nucleolus which is closely associated with nucleolar organizer region of two or more chromosomes of the set.(3M)

Diagram (2M)