SET	C

INDIAN SCHOOL MUSCAT

HALF YEARLY EXAMINATION 2022

086 SCIENCE

CLASS IX

MARKING SCHEME

TOTAL MARKS :80

GENERAL INSTRUCTIONS:

SECTION - A

1.	momentum	1
2.	$4m/s^2$	1
3.	Ball D,4kg	1
4.	a. Balanced	1
5.	Uniform velocity.	1
6.	acceleration	1
7.	b) Uniform circular motion	1
8.	solute	1
9.	a molecule is two or more atoms connected by chemical bonds	1
10.	water	1
11.	a	1
12.	d	1
13.	Name the plastid which helps in colouration to flowers and fruits for attracting insects/animals to perform pollination and dispersal respectively. Chromoplast.	1
14.	What is osmosis?	1

	Osmosis is diffusion of water from the region of its higher concentration (pure water or dilute solution) to the region of its lower concentration (strong solution) through a semipermeable membrane.	
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 50 km/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?	1

	b) Robert Brown	
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/s^2 VELOCITY- • Defined as change in displacement per unit time SI Unit m/s	2
22.	the solution is unsaturated when it can still dissolve more solute 1 1/2 at a given teperature 1/2	2
23.	chemical the element are always present in the definite proportion mass	2
24.	any two differences between element and compound (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.	Name the process by which (a) Oxygen moves in and out of the cell. (b) Water moves in and out of the cell. (a) Diffusion. (1M) (b) Osmosis (1M)	2
27.	Distinguish between prokaryotic cell and eukaryotic cell.	3

Prokaryotic cell	**Eukaryotic cell**

	This cells are always unicellular	Eukaryotic cells are present as either unicellular or multicellular.	
	The size of cell is generally range from 0.2 micrometers to 2.0 micrometers in diameter	Eukaryotic cells range from 10 to 100 micrometers in diameter.	
	In prokaryotic cells, the cell wall is present and it is very complex in nature.	Eukaryotic cells have cell walls very rarely; if present they have simple chemical nature.	
	In this cells true nucleus absent, instead nucleotide is present	True nucleus is present.	
	DNA is arranged in circular shape	DNA is linear in shape	
	In prokaryotic cells, cytoplasm is present, but it is lacking in most cell organelles.	In eukaryotic cells, it consists of both cytoplasm and organelles, both are present.	
	In prokaryotic cells, the cell wall is present and it is very complex in nature.	Eukaryotic cells have cell walls very rarely; if present they have simple chemical nature.	

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) solution that contains large amount of solute relative to the amount that could dissolve. (1)
(ii)
concentration = mass of solute/mass of solution
= 36/136 x 100
= 26.47 % (2)

3

31.	What are meristematic tissues? Explain with the help of suitable diagram. 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).	3
32.	Write a short note on collenchyma. These are elongated living cells with small intercellular spaces. Their cell walls are made up of cellulose and pectin. It is located in the leaf stalks below the epidermis and provide mechanical support and flexibility in plants. Or Which elements of xylem i) Help in transport of water and minerals. ii) Stores food. iii) Provide mechanical support. i) Tracheid's and vessels (1M) ii) Xylem Parenchyma (1M) iii) Xylem Fibres (1M)	3

33. 5

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 Δ ABC + Area of rectangle OACD

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

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

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

We know $v = u + at$

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

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

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

or $2aS = (v + u)(v - u)$
$= v^2 - u^2$ $[\because A^2 - B^2 = (A + B)(A - B)]$

∴ $v^2 - u^2 = 2aS$, ...(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

u=0

v=10 m/s

t=40 s

a=(v-u)/t (1 mark)

□a = ¼=0.25 m/s² (1 mark)

SECOND CASE

u = 10 m/s

v = 5 m/s

t = 10 s

a=(v-u)/t (1 mark)

□ a = -5/10 = -0.5 m/s² (1 mark)

34.	(i) mass neither be created nor destroyed in a chemical reaction (2) (ii) six daltons postulates (3) (each postulate half mark) or (i) Sodium carbonate + Ethanoic acid → Sodium ethanoate + Carbon dioxide + W 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 pr (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.	5

	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. 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)	