SET	A

INDIAN SCHOOL MUSCAT
HALF YEARLY EXAMINATION 2023
Science (086)

CLASS:IX Max.Marks: 80

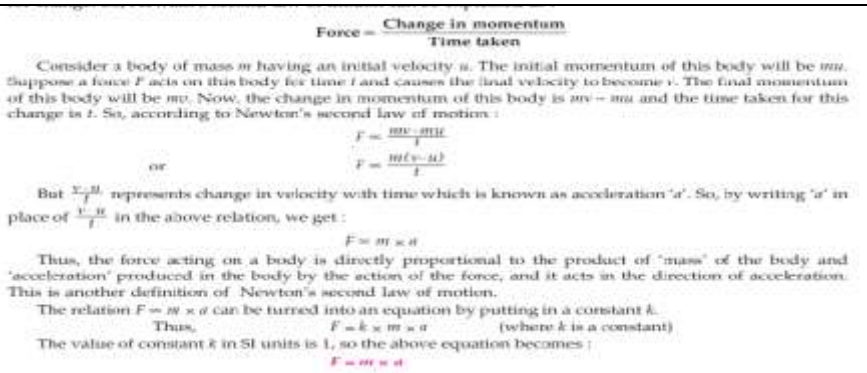
MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
A	1	(c) Evaporation, diffusion, expansion of gases	
	. 2	(b) Liquid	
	. 3	(c) 308 K, 329 K, 391 K Explanation: Kelvin Temperature = Degree Celsius + 273 The boiling point of diethyl ether, acetone and n-butyl alcohol is: 35°C + 273 = 308 K 56°C + 273 = 329 K 118°C + 273 = 391 K Thus, 308 K, 329 K and 391 K represent their boiling points in the Kelvin scale of temperature	
	. 4	(c) (I), (II), (III) and (V) are correct. Explanation: When a solid is converted into liquid, particles gain more kinetic energy due to this the compressibility increases as well as the pressure increases. As the spacing is not close, it will not be rigid, it will be easy to flow and hence, will show fluidity	
	. 5	The correct option is (a) decrease.	
	. 6	(a) Single	
	7	(a) tincture of iodine	

	. 8	b/a	
	9	c	
	10	b/c/a	
	11	d	
	12	b	
	13	velocity	
	. 14	Vector ,kgm/s	
	15	(a)A compound	
	16	c	
	17	A. Both A and R are true, and R is the correct explanation of A.	
	18	Option B is correct	
	19	(b) Both A and R are true and R is not the correct explanation of A. Explanation: Water can exist in all three states of matter. It becomes ice at 0 degrees Celsius and evaporates at 100 degrees Celsius.	
	20	c. A is true but R is false.	
	21	The properties of particles of matter are as follows: (1) The size of particles of matter is extremely small. (2) There is space between particles of matter. (3) Particles of matter are attracted to one another. (4) Particles of matter are continuously moving	
	22	Mitochondria. Because it synthesize energy in the form of ATP molecules. C-Chloroplast. Because it contains chlorophyll pigment which helps in photosynthesis.	
	23	Because of the presence of large air cavities in their parenchyma. OR	

		A-Difference between prokaryotic and eukaryotic cells. B-Difference between cell wall and cell membrane. C- Difference between chlorenchyma and aerenchyma.	
	24	5.5 m/s	
	25	a) $0.016 m/s^2$ Or b) Distance time graph Velocity time graph	
	26	Solute: The component of the solution that is dissolved in the solvent (usually present in the lesser quantity) is solute. Solvent: The component of a solution that dissolves the other component in it (usually the component present in larger amounts) is called solvent	
	27	Below are the steps for making tea: (1) At first, take 100 mL of water as solvent and boil it for few minutes. (2) While solvent is boiling, add solutes, i.e., milk, tea leaves, sugar. (3) Now, boil the solution again for few minutes. Sugar gets dissolved as it is soluble in water. (4) Tea leaves drops their colour into solution as filtrate. The remaining tea leaves being insoluble remains as residue. (5) Now, filter the solution. (6) Collect the filtrate in a cup.	
	28	) Sublimation)Diffusion	1 1

		) Diffusion or Mass of sodium chloride (solute) =36 g Mass of water (solvent) = 100g Mass of solution is the sum of solute and solvent ⇒36+100=136g Therefore, concentration percentage = mass of solute / mass of solution X 100=36 / 136 ×100 =26.47%	1 1 1 1
	29	. Nucleus: it carries the characteristics of inheritance from parents to offsprings. . Golgi apparatus: It help in the storage, packaging and modification of proteins. Chromoplast: it helps in pollination	
	30	۸- The cork cells are dead without intercellular space. The cell wall of these cell secrete a chemical substance called suberin, which makes them impervious (impermeable) to gas and water. the epidermis secrete the chemical waxy water resistance layer called cutin, which helps to reduce the rate of transpiration, prevents the injury, prevents the invasion of pathogen	
	31	v = u + at s = ut + 1 /2 at² v2 = u2 + 2as. Where, u=initial velocity v= final velocity a= acceleration t=time taken s= distance/dispalcement	3

	32	Inertia is that property of a body due to which it resists a change in its state of rest or of uniform motion, mass, cricket ball	
	33	MASS- remains constant,SI Unit Kg,Scalar WEIGHT –changes,SI Unit N,Vector	
	34	Solution Defination Any 4 properties of solution 1)A solution is a homogeneous mixture. 2)The size of solute particle is very small i.e. less than 1 nm.The particle of a solution cannot be seen by naked eyes. 3)The particle of a solution can pass through filter paper.A solution cannot be separated by filtration. 4)The particles of solute present in solution do not settle down when left undisturbed, that is, solution is stable. 5)A solution does not scatter a beam of light passing through it as particles are very very small.so the path of light is not visible in the solution. OR Five differences on shape,volume,compressibility,diffusion,density	
	35	)Different types of meristematic tissues with function and location.)Well labelled diagram. OR)Phloem)Transportation of food)V-Phloem parenchyma, W- Sieve tubes, X- Sieve plates and Y- Companion cells)Storage of food.	3+2 1+1+1++1
	36	a.The rate of change of momentum of a body is directly proportional to the applied force, and takes place in the direction in which the force acts DERIVATION –	3+2=5

		 $\text{Force} = \frac{\text{Change in momentum}}{\text{Time taken}}$ Consider a body of mass m having an initial velocity u. The initial momentum of this body will be mu. Suppose a force F acts on this body for time t and causes the final velocity to become v. The final momentum of this body will be mv. Now, the change in momentum of this body is $mv - mu$ and the time taken for this change is t. So, according to Newton's second law of motion : $F \propto \frac{mv - mu}{t}$ or $F = \frac{m(v-u)}{t}$ But $\frac{v-u}{t}$ represents change in velocity with time which is known as acceleration 'a'. So, by writing 'a' in place of $\frac{v-u}{t}$ in the above relation, we get : $F = m \times a$ Thus, the force acting on a body is directly proportional to the product of 'mass' of the body and 'acceleration' produced in the body by the action of the force, and it acts in the direction of acceleration. This is another definition of Newton's second law of motion. The relation $F = m \times a$ can be turned into an equation by putting in a constant k. Thus, $F = k \times m \times a$ (where k is a constant) The value of constant k in SI units is 1, so the above equation becomes : $F = m \times a$ b. (i) -4m/s² (ii) -4000N OR . To every action there is an equal and opposite reaction.ex1. When we walk on the ground, then our foot pushes the ground backward and, in return, the ground pushes our foot forward Ex2. Jet aeroplanes utilise the principle of action and reaction . When firemen are directing a powerful stream of water on fire from a hose pipe, they have to hold the hose pipe strongly because of its tendency to go backward. The backward movement of the hose pipe is due to the backward reaction of water rushing through it in the forward direction at a great speed	
	37	d) all of these (a) shape, volume (b) the presence of dissolved oxygen in the water (c) both (a) and (b) (c) Gases and liquids behave like fluids	
	38	) I) Animal cell ii) Plant cell) Presence of plastids and cell wall in plant cells OR Lysosomes. Because they contains digestive enzymes which burst opens when there is any damage or entry of pathogens inside the cell.	
	39	1) ii. m/s²	

		2) i. Always towards center of earth 3) ii. Weight and force 4) ii. g OR The uniform acceleration produced in a freely falling body due to the gravitational force of the earth is known as acceleration due to gravity	

SET	B

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MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
	1.	(a) vaporization and condensation	1
	2.	b) A homogeneous mixture of two or more substances	1
	3.	(c) 27 ºC	1
	4.	(b) Solubility increases with increasing temperature.	1
	5.	(c) Evaporation, diffusion, expansion of gases	1
	6.	(b) Liquid	1
	7.	(c) 308 K, 329 K, 391 K Explanation: Kelvin Temperature = Degree Celsius + 273 The boiling point of diethyl ether, acetone and n-butyl alcohol is: 35°C + 273 = 308 K 56°C + 273 = 329 K 118°C + 273 = 391 K Thus, 308 K, 329 K and 391 K represent their boiling points in the Kelvin scale of temperature.	1
	8.	a	1
	9.	c	1
	10.	c	1
	11.	d	1

	12.	b	1
	13.	uniform circular motion	1
	14.	(c) Newton's first law of motion	1
	15.	c) Mixture of salt and iron filings	1
	16.	c	1
	17.	a. Both A and R are true and R is the correct explanation of A.	1
	18.	(d) A is false but R is true	1
	19.	b. Both A and R is true but R is not the correct explanation of A.	1
	20.	c. A is true but R is false.	1
	21.	Any two differences	2
	22.	Mitochondria. Because it synthesize energy in the form of ATP molecules.	1+1
	23.	Because of the presence of large air cavities in their parenchyma. OR Difference between cell wall and cell membrane.	2 2
	24.	(a) 20 m/s (b) 100 m	1+1
	25.	(a) $0.016 m/s^2$ Or (b) I. Distance time graph II. Velocity time graph	2
	26.	Due latent heat of vaporization. When we place nail polish remover or perfume on our palm we feel cold because of latent heat of vaporization.	2
	27.	a) Defination b) Solute and solvent c) When a saturated solution is heated it can be converted into unsaturated one.	1 1 1

	28.	a)Condensation b)Sublimation c)Evapouration OR Mass of solute (NaCl) =60 g Mass of solvent (water) =400 g Mass of solution = Mass of solute ++ Mass of solvent ⇒60+400=460 g Mass percentage of the solution is the percentage of the ratio of the mass of solute to the mass of solution. ⇒60/ 460 ×100 =13.4%	1 1 1
	29.	a. Nucleus: it carries the characteristics of inheritance from parents to offsprings. b. Golgi apparatus: It help in the storage, packaging and modification of proteins. c. Chromoplast: it helps in pollination	1 1 1
	30.	The epidermis secrete the chemical waxy water resistance layer called cutin, which helps to reduce the rate of transpiration, prevents the injury, prevents the invasion of pathogen.	3
	31.	v = u + at s = ut + 1 /2 at² v2 = u2 + 2as. Where, u=initial velocity v= final velocity a= acceleration t=time taken s= distance/dispalcement	3

	32.	Inertia is that property of a body due to which it resists a change in its state of rest or of uniform motion, mass, cricket ball	3
	33.	MASS- remains constant,SI Unit Kg,Scalar WEIGHT –changes,SI Unit N,Vector	3
	34.	(A) The two ways by which the physical state of the matter can be changed is either by melting or boiling. (B) Interconversion diagram (C) The evaporation of liquids can be made faster by: (1) Increasing the temperature of the liquid (2) Increasing the surface area of liquid (3) Increasing the wind speed Or Definition of matter and its properties.	1 2 2 1+4
	35.	a) Different types of meristematic tissues with function and location. b) Well labelled diagram. OR a) Phloem b) Transportation of food c) V-Phloem parenchyma, W- Sieve tubes, X- Sieve plates and Y- Companion cells d) Storage of food.	3+2 1+1+1++1
	36.	a.The rate of change of momentum of a body is directly proportional to the applied force, and takes place in the direction in which the force acts. DERIVATION:	5

		$$\text{Force} = \frac{\text{Change in momentum}}{\text{Time taken}}$$ Consider a body of mass m having an initial velocity u. The initial momentum of this body will be mu. Suppose a force F acts on this body for time t and causes the final velocity to become v. The final momentum of this body will be mv. Now, the change in momentum of this body is $mv - mu$ and the time taken for this change is t. So, according to Newton's second law of motion : $$F \propto \frac{mv - mu}{t}$$ or $$F \propto \frac{m(v-u)}{t}$$ But $\frac{v-u}{t}$ represents change in velocity with time which is known as acceleration 'a'. So, by writing 'a' in place of $\frac{v-u}{t}$ in the above relation, we get : $$F \propto m \times a$$ Thus, the force acting on a body is directly proportional to the product of 'mass' of the body and 'acceleration' produced in the body by the action of the force, and it acts in the direction of acceleration. This is another definition of Newton's second law of motion. The relation $F \propto m \times a$ can be turned into an equation by putting in a constant k. Thus, $F = k \times m \times a$ (where k is a constant) The value of constant k in SI units is 1, so the above equation becomes : $$F = m \times a$$ b. (i) -4m/s² (ii) -4000N OR a. To every action there is an equal and opposite reaction.ex1. When we walk on the ground, then our foot pushes the ground backward and, in return, the ground pushes our foot forward Ex2. Jet aeroplanes utilise the principle of action and reaction a. When firemen are directing a powerful stream of water on fire from a hose pipe, they have to hold the hose pipe strongly because of its tendency to go backward. The backward movement of the hose pipe is due to the backward reaction of water rushing through it in the forward direction at a great speed	
	37.	(A) The temperature at which the liquid boils and changes into a gaseous state at the atmospheric pressure is called the boiling point.Water boils at 100°C to form water vapour. (B) Bulk phenomenon is a phenomenon in which every molecule of a bulk gains enough energy due to heating to get converted into vapours. OR Evaporation is not the same as boiling because the process of converting a liquid into vapours at any temperature above melting point and below its boiling point is known as evaporation. While boiling is the process of vaporization at boiling point where vapour pressure becomes equal toatmospheric pressure.	2+2
	38.	a) I) Animal cell ii) Plant cell b) Presence of plastids and cell wall in plant cells	2+2

		OR Lysosomes. Because they contains digestive enzymes which burst opens when there is any damage or entry of pathogens inside the cell.	
	39.	1) ii. m/s^2 2) i. Always towards center of earth 3) ii. Weight and force 4) ii. g OR The uniform acceleration produced in a freely falling body due to the gravitational force of the earth is known as acceleration due to gravity	2+2

SET	C

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MARKING SCHEME			
SET	QN.NO	VALUE POINTS	MARKS SPLIT UP
	1.	(a)A compound	1
	2.	(a) tincture of iodine	1
	3.	(a) Single	1
	4.	The correct option is (a) decrease.	1
	5.	(c) (I), (II), (III) and (V) are correct. Explanation: When a solid is converted into liquid, particles gain more kinetic energy due to this the compressibility increases as well as the pressure increases. As the spacing is not close, it will not be rigid, it will be easy to flow and hence, will show fluidity	1
	6.	b) A homogeneous mixture of two or more substances	1
	7.	(c) 27 ºC	1
	8.	Biology	
	9.	Biology	
	10.	Biology	
	11.	Biology	

	12.	Biology	
	13.	(c) motion of a racing car on a circular track	
	14.	Kgm/s	
	15.	(c) Evaporation, diffusion, expansion of gases	1
	16.	Biology	
	17.	1N	
	18.	(d) A is false but R is true	1
	19.	(b) Both A and R are true and R is not the correct explanation of A. Explanation: Water can exist in all three states of matter. It becomes ice at 0 degrees Celsius and evaporates at 100 degrees Celsius.	1
	20.	Biology	
	21.	Due latent heat of vaporization. When we place nail polish remover or perfume on our palm we feel cold because of latent heat of vaporization	2
	22.	Biology	
	23.	Biology or biology	
	24.	$-2m/s^2$	
	25.	(a) $0.016m/s^2$ Or (b) I. Distance time graph II. Velocity time graph	
	26.	The properties of particles of matter are as follows: (1) The size of particles of matter is extremely small. (2) There is space between particles of matter. (3) Particles of matter are attracted to one another. (4) Particles of matter are continuously moving.	2

	27.	a) Defination b) Solute and solvent c) When a saturated solution is heated it can be converted into unsaturated one.	1 1 1
	28.	a) Sublimation b) Diffusion c) Diffusion or Mass of sodium chloride (solute) =36 g Mass of water (solvent) = 100g Mass of solution is the sum of solute and solvent ⇒36+100=136g Therefore, concentration percentage = mass of solute / mass of solution X 100=36 / 136 ×100 =26.47%	1 1 1 1 1 1
	29.	Biology	
	30.	Biology	
	31.	v = u + at s = ut + 1 /2 at² v2 = u2 + 2as. Where, u=initial velocity v= final velocity a= acceleration t=time taken s= distance/dispalcement	
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	33.	MASS- remains constant,SI Unit Kg,Scalar WEIGHT –changes,SI Unit N,Vector	
	34.	Solution Defination Any 4 properties of solution 1)A solution is a homogeneous mixture. 2)The size of solute particle is very small i.e. less than 1 nm.The particle of a solution cannot be seen by naked eyes. 3)The particle of a solution can pass through filter paper.A solution cannot be separated by filtration. 4)The particles of solute present in solution do not settle down when left undisturbed, that is, solution is stable. 5)A solution does not scatter a beam of light passing through it as particles are very very small.so the path of light is not visible in the solution. OR Five differences on shape,volume,compressibility,diffusion,density	1 4 5
	35.	Biology or biology	
	36.	a.The rate of change of momentum of a body is directly proportional to the applied force, and takes place in the direction in which the force acts DERIVATION – $\text{Force} = \frac{\text{Change in momentum}}{\text{Time taken}}$ Consider a body of mass m having an initial velocity u. The initial momentum of this body will be mu. Suppose a force F acts on this body for time t and causes the final velocity to become v. The final momentum of this body will be mv. Now, the change in momentum of this body is $mv - mu$ and the time taken for this change is t. So, according to Newton's second law of motion : $F \propto \frac{mv - mu}{t}$ or $F = \frac{m(v-u)}{t}$ But $\frac{v-u}{t}$ represents change in velocity with time which is known as acceleration 'a'. So, by writing 'a' in place of $\frac{v-u}{t}$ in the above relation, we get : $F \propto m \times a$ Thus, the force acting on a body is directly proportional to the product of 'mass' of the body and 'acceleration' produced in the body by the action of the force, and it acts in the direction of acceleration. This is another definition of Newton's second law of motion. The relation $F \propto m \times a$ can be turned into an equation by putting in a constant k. Thus, $F = k \times m \times a$ (where k is a constant) The value of constant k in SI units is 1, so the above equation becomes : $F = m \times a$	

		b. (i) -4m/s² (ii) -4000N OR a. To every action there is an equal and opposite reaction.ex1. When we walk on the ground, then our foot pushes the ground backward and, in return, the ground pushes our foot forward Ex2. Jet aeroplanes utilise the principle of action and reaction b. When firemen are directing a powerful stream of water on fire from a hose pipe, they have to hold the hose pipe strongly because of its tendency to go backward. The backward movement of the hose pipe is due to the backward reaction of water rushing through it in the forward direction at a great speed	
	37.	(A) The temperature at which the liquid boils and changes into a gaseous state at the atmospheric pressure is called the boiling point.Water boils at 100°C to form water vapour. (B) Bulk phenomenon is a phenomenon in which every molecule of a bulk gains enough energy due to heating to get converted into vapours. Or Evaporation is not the same as boiling because the process of converting a liquid into vapours at any temperature above melting point and below its boiling point is known as evaporation. While boiling is the process of vaporization at boiling point where vapour pressure becomes equal toatmospheric pressure.	2 2
	38.	Biology a) b) OR	
	39.	Physics 1) ii. m/s² 2) i. Always towards center of earth 3) ii. Weight and force 4) ii. g OR The uniform acceleration produced in a freely falling body due to the gravitational force of the earth is known as acceleration due to gravity	
