MAHESH TUTORIALS

9th CBSE
Batch :

SUBJECT : SCIENCE & TECHNOLOGY
Chapter : 1, 2, 5, 6, 8, 9
Model Answer Paper

Test -
Date:
Marks : 60
Time: 2 Hrs

Q : 1	**Answer the following questions : [1 Marks]**	**05**
1.	chloroform, water	1
2.	Muscular tissues.	1
3.	Functions of stomata :	
i)	**Gaseous Exchange :** Stomata are sites where exchange of gases (carbon dioxide and oxygen) occurs between the plant interior and external environment.	½
ii)	**Transpiration :** Major part of transpiration occurs through stomata. Transpiration removes excess water and keeps plant surfaces cool even in bright sun.	½
iii)	**Regulation :** They regulate both gaseous exchange and transpiration.	
4.	The SI unit of force is <u>newton (N)</u>.	1
5.	(d) quantity of motion	1
Q : 2	**Answer the following questions : [2 Marks]**	**16**
6.	The force of attraction between particles of gas is negligible. Because of this, particles of gas move in all directions. Thus, a gas fills the vessel completely in which it is kept.	2
7.	(a) Temperature on Kelvin scale = Temperature on Celsius scale + 273, Therefore, Temperature on Celsius scale = Temperature of Kelvin scale - 273 Hence, Temperature on Celsius scale = 300K - 273 = 27°C (b) Temperature on Kelvin scale = Temperature on Celsius scale + 273 Therefore, Temperature on Celsius scale = Temperature of Kelvin scale - 273 Hence, Temperature on Celsius scale = 573K - 273 = 300°C	½ ½ ½ ½

8.

Homogeneous mixtures	Heterogeneous mixtures	
Homogeneous mixtures have uniform composition.	Heterogeneous mixtures have non uniform composition.	1
It has no visible boundaries of separation between its constituents.	It has visible boundaries of separation between its constituents.	1

9. Robert Hooke (1665). He prepared a thinly piece of cork and observed it under microscope. He observed that cork possesses a number of small box-like structures which he named cells. — 2

10.

Xylem	Phloem	
a. Xylem mainly consists of dead cells (except xylem parenchyma).	a. Phloem consists of living cells (except phloem fibre).	1
b. It conducts water and minerals from roots to aerial parts of the plant.	b. It translocates prepared food from leaves to storage organs and growing parts of the body.	1

11.	Functions of epithelial tissue : (i) Epithelial cells protect the underlying cells from drying, injury and chemical effects. They also protect the body from viral or bacterial infection. (ii) It helps in the absorption of water and nutrients. (iii)It performs secretary function by secreting useful chemicals like sweat, saliva, enzymes from the food, etc., in the body.	1 ½ ½
12.	(a) An object has a uniform velocity if it travels in a given direction in a straight line and covers equal distances in equal intervals of time. (b) An object has a non - uniform velocity if it produces unequal displacement in equal intervals of time.	1 1
13.	When the bullet strikes the glass. The part of the glass which comes in contact with the bullet immediately shares the large velocity of bullet and makes a hole while the remaining part of the glass due to inertia of rest remains at rest and is therefore not smashed. When a stone with low velocity strikes the glass, the surrounding part of the glass gets time to share the velocity of the stone. Thus the glass is smashed.	1 1
Q : 3	**Answer the following questions : [3 Marks]**	**24**
14.	(i) Melting point :- The melting point of a solid is that temperature at which it changes into the liquid. From the beginning to the end of melting, the temperature does not change. (ii) Boiling point :- The boiling point of a liquid is that temperature at which a liquid starts boiling at the atmospheric pressure.	2 1
15.	The following materials fall in the category of a "pure substance": (a) Ice (c) Iron (d) Hydrochloric acid (e) Calcium oxide (f) Mercury	1 2
16.	It is a complex network of membrane - bound channels, sheets, tubules and vesicles. It is continuous between outer nuclear membrane and plasma membrane. There are two types of ER. Rough ER - which is characterised by the presence of ribosomes on its surface. Smooth ER - which is devoid of ribosomes on its surface. Functions of endoplasmic reticulum (ER) • Rough ER is the site of protein synthesis. • Smooth ER helps in lipid synthesis. • It helps in the transport of substances. • It gives internal support to the cytoplasm. • Smooth ER in liver cells takes part in detoxifying poisons and drugs.	½ ½ ½ ½ ½ ½
17.	• The cells are with thin cell walls. • They are living cells. • They are loosely packed. • They have tough intercellular spaces. **Functions :** • It provides support to plants. • It also stores food. • It forms the packing tissue of all plant organs. • In some parenchyma tissue cells contains chlorophyll. Then it is called chlorenchyma. It performs photosynthesis. • In aquatic plants, parenchyma contains large air cavities. It gives buoyancy to the plants to help them float. Such parenchyma is known as aerenchyma. • The parenchyma of stems and roots also stores nutrients and water.	½ ½ ½ ½ ½ ½

18.	These are small spherical vesicles covered by a single membrane which contains digestive enzymes. They are called 'suicide bags'. Plant cell generally lack lysosomes. Functions of lysosomes: • It help in the destruction of foreign particles. • They help in intracellular digestion of food particles. • They help in removing dead and worn out cellular organelles by digesting them.	1 ½ ½ 1
19.	(a) The body has uniform velocity. (b) The body has uniform acceleration and its initial velocity is zero. (c) The body has some initial velocity and is under uniform retardation. (d) The body has some initial velocity and uniform acceleration. (e) The body has zero iniital velocity and it has variable acceleration. (f) The body is at rest from O to A, it has uniform acceleration from A to B, uniform velocity from B to C and from C to D, the body is under uniform retardation.	½ ½ ½ ½ ½ ½
20.	Newton's third law of motion states that, "When one object exerts a force on another object, the second object instantaneously exerts an equal and opposite force on the first." We can also state Newton's third law of motion as "To every action, there is an equal and opposite reaction". Some examples to illustrate Newton's third law of motion are :	2
1.	When we walk on the ground, our foot pushes the ground backward and in return, the ground pushes our foot forward. The forward reaction exerted by the ground an our foot makes us walk forward.	1½
2.	A swimmer pushes the water backwards with his hands and feet to move in the forward direction in water. It is the equal and opposite reaction to this force which pushes the swimmer forward.	1½

21.	Here, m = 1,500 kg, a = –1.7 ms^{-2}
	∴ F = ma
	          = 1,500 × (–1.7)
	          = – 2,550 N
	The force between the vehicle and the road is 2,550 N, in a direction opposite to the direction of the vehicle.
		1
		1
		1
		1
		1

Q : 4	**Answer the following questions : [5 Marks]**	15
22.	**Plant cell** 	5
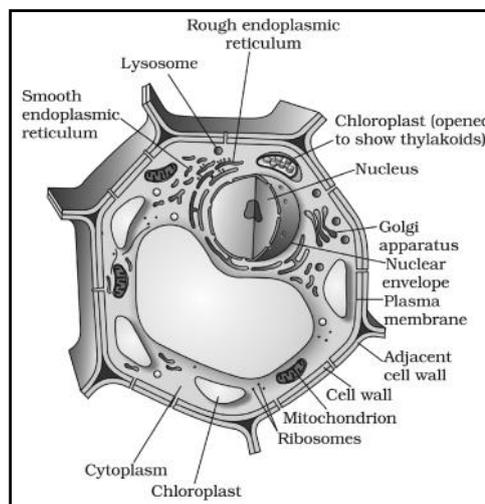
23.	The given mixture can be separated using the following process.	
	Magnetic Separation: Using magnetic separation the iron fillings can be separated from the given mixture.	½
	In this a magnet is hover just above the mixture, since iron is a magnetic substance it is attracted by magnet and stuck with it. By this first of all iron fillings are separated.	½
	Sublimation : After the separation of iron fillings, ammonium chloride is separated by the process of sublimation.	
	Since, ammonium chloride is a sublimate and it turns into vapour directly without changing into liquid, thus when the mixture is sublimated, the ammonium chloride is deposited over the inner wall of funnel leaving the sodium chloride and sand in the watch glass. Ammonium chloride is separated by scratching from the inner wall of the funnel.	½ ½ ½
	Filtration : Now the left mixture of sand and sodium chloride is put in water, after stirring the sodium chloride is dissolved in water. The solution is separated by the process of filtration. The sand left over the filter paper is separated out.	½ ½
	Vaporisation : By the process vaporization, the liquid so obtained is vapouried and crystals of ammonium chloride can be obtained.	½
	Hence, by using the methods of magnetic separation, sublimation, filteration and vapourisation and crystallization the component of given mixture of sand, iron fillings, ammonium chloride and sodium chloride can be separated.	½ ½

24.	Newton's second law of motion states that, "That rate of change of momentum of an object is proportional to the applied unbalanced force in the direction of force".	½
	Consider an object of mass 'm' is moving along a straight line with an initial velocity 'u'. It is uniformly accelerated to the velocity 'v' in time 't' by applying a constant force 'F'. The uniform acceleration is 'a'. Thus, the initial and final momentum of the object will be p_1 = mu and p_2 = mv, respectively.	½
	So, according to the Newton's second law of motion,	½
	Force α Rate of change of momentum	
	$\therefore$ Force α $\dfrac{\text{Change of momentum}}{\text{time}}$	½
	$\therefore$ Force α $\dfrac{\text{Final momentum} - \text{Initial momentum}}{\text{time}}$	½
	$\therefore$ F α $\dfrac{p_2 - p_1}{t}$	½
	$\therefore$ F α $\dfrac{mv - mu}{t}$	
	$\therefore$ F α $m\left(\dfrac{v - u}{t}\right)$	½
	$\therefore$ F α ma $\left[\text{since a} = \dfrac{v - u}{t}\right]$	½ ½
	$\therefore$ F = kma ... (1) [Where k is a constant]	
	The SI units of mass and acceleration are kg and m/s^2, respectively. The unit of force is so chosen that the value of the constant, k becomes 1.	½
	Substituting k = 1 in equation (1), we get	
	F = ma	

★ ★ ★ ★ *Best of Luck* ★ ★ ★ ★