

BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

MID-TERM EXAMINATION 2023-24



SCIENCE(086)



Duration : 3 Hrs Max. Marks: 80

Class : IX : 11.10.23 Date

MARKING SCHEME

Section-A 1. (a) Displacement 1 2. (b) Inertia of rest 1 3. (d) Heterogeneous 1 4. (a) Alloy 1 5. (d) Zinc, Copper 1 6. (a) Solute 1 7. (a) Cotton 1 8. (d) Insoluble heavy impurities 1 9. (c) Particles of water at 100 °C 1 10. (b) Phloem 1 11. (b) Presence of DNA 1 12. (b)connective tissue 1 13. (d) all of the above 1 14. (b) Cytoplasm 1 15. (c) Cell membrane 1 16. (c) Golgi apparatus 1 ASSERTION AND REASON 17. (a) Both assertion and reason are true, and reason is the correct explanation of assertion. 1 18. (a) Both assertion and reason are true, and reason is the correct explanation of assertion . 1 19. (a) Both assertion and reason are true, and reason is the correct explanation of assertion. 1 20. (c) Assertion is true, but reason is false. 1 Section-B 21. Given : m1=m2=1.5 kg 2

u1=2.5 ms-1 u2=2.5 ms-1 Total mass of the combined system, M=m1+m2=2×1.5=3kg Let the velocity of the combined system after the collision be v Applying conservation of momentum before and after the collision : m1u1-m2u2=Mv 1.5×2.5-1.5×2.5=3v ⇒v=0

22. (a)When the mass of an object is doubled then the force between them is doubled. (b)When the distance between the objects is doubled then force between them is one fourth. When the distance between the objects is tripled then force between them is one ninth. 2

OR

(a). Free fall when an object falls freely due gravitational force of earth then it si said to be free fall. (b). when an object falls freely due gravitational force of earth, its velocity changes ,hence it acquires acceleration. 2

23. Iodine in alcohol is called Tincture of Iodine. Iodine is solute and alcohol is solvent

24. MITOCHONDRIA



25. Ans :1.Sclerenchyma cells are usually dead cells .

½ x4points= 2

1

1

2

2

- 2. They have heavily thickened secondary walls containing lignin.
- 3. The cells are rigid and non-stretchable.
- 4. Found in nongrowing regions of plant bodies, such as the bark or mature stems.
- 26. Ans (a)Chlorenchyma is a specialized parenchyma tissue that contains chloroplasts and carries out photosynthesis. 1 1
 - (b). Aerenchyma is a spongy tissue that contains large air paces.

OR

- (a). Cardiac muscle tissue Heart, to contract and relax heart
- (b). Adipose tissue -under the skin, releases energy and provides insulation,

Section-C

27. Step 1 –

Given v=72 km/h (final velocity) =72×185=20 m/s u=0 (initial velocity) t=5 min (time)=5×60=300sec 3 Step 2 - Find acceleration v=u+at 20=0+a(300) a=151m/s2 (acceleration) Step 3 - Distance travelled by train By second equation of motion S=ut+21at² S=0+21(151)(300)2 S=3000 m (distance)

28. According to the newton's third law of motion, whenever one body exerts a force on another body, the second body exerts an equal and opposite force on the first body. In other words, to every action, there is an equal and opposite reaction. Two examples to illustrate this law-When a man jumps out from a boat, the boat moves backwards. This is due to the fact that to step out of the boat, the man presses the boat with his foot in the backward direction. The push of the man on the boat is not fixed and is floating, it moves backwards due to the action force exerted by the man.

Gunman gets a jerk on firing a bullet from his gun. This is because when a bullet is fired from a gun, the force sending the bullet forward is equal to the force sending the gun backwards but due to high mass of the gun, it moves only a little distance backwards giving a jerk to the gunman. 1+2

29. (a).Newton's first law states that if a body is at rest or moving at a constant speed in a straight line,

it will remain at rest or keep moving in a straight line at constant speed unless it is acted upon by a force.

(b). Due to Inertia of motion and Inertia of rest

30. (a) The molecules of gas have high kinetic energy due to which they keep moving in all directions and hence fill the vessel completely in which they are kept.

(b) A gas exerts pressure on the walls of the container because the molecules of the gas are in constant random motion due to high kinetic energy. These molecules constantly vibrate, move and hit the walls of the container thereby exerting pressure on it.

(c) The molecules/particles of wooden table are tightly packed with each

other, there is no intermolecular space, it cannot be compressed, it cannot flow, all these characteristics are of solid. So wooden table should be called a solid. '

31. Ans: Mass of solute (sodium chloride) = 40 g

Mass of solvent (water) = 320 g Mass of solution = Mass of solute + Mass of solvent = 40 g + 320 g = 360 g

By putting the formula Concentration = 40/360 X100 =11.1%

Concentration = $\frac{\text{Mass of solute}}{\text{Mass of solution}} \times 100$ = $\frac{36}{136} \times 100 = 26.47\%$

OR

Answer: Mass of solute (sodium chloride) = 40 g Mass of solvent (water) = 320 g Mass of solution = Mass of solute + Mass of solvent = 40 g + 320 g = 360 g By putting the formula Concentration = 40/360 X100 =11.1%

32. Ans:

1/2 x 6 points= 3

1+1+1

Voluntary muscles	Involuntary muscles
(i) Their action is under our conscious control.	(i) Their action is not under our conscious control.
(ii) Cells are multinucleate.	(ii) Cells are uninucleate.
(iii) Example: Skeletal muscles	(iii) Example: Smooth muscle

33.Ans :The sensory neurons carry information from the sensory receptor cells to the brain.Dia 1+2The motor neurons transmit information from the brain to the muscles.Dia 1+2

The Association neurons mediate reflex action.



a) Apical meristem

b) Intercalary meristem

c) Lateral meristem

Section-D

34. (a). Newton's universal law of gravitation states that when two body are separated by a distance r, then both attract each other with a force which is directly proportional to the product of their masses (m1 and m2) and inversely proportional to the square of distance between them (r). This force is termed as gravitational force. Mathematically, gravitation force is given by $F=Gm1m2/r^2$ where G is gravitational constant.

 $G = F r^2/m1 m2$

 $G = Nm^2/Kg^2$

OR

1+2+2

1

1 1

Law of conservation of momentum states that in the absence of external forces, total momentum of a system comprising of two or more interacting bodies is constant.

Derivation:

Let us consider two moving balls A and B of masses m1 and m2 and having initial velocities u1 and u2 such that u2<u1.

Suppose the balls collide at some point and there is no external force acting on this system.

Let their final velocities be v1 and v2 respectively.

According to Newton's third law of motion,

Force on ball B due to A = -Force on ball A due to B.

OR

FAB=-FBA.....(i)

Total initial momentum before collision (pi)=m1u1+m2u2.

Total final momentum after collision (pf)=m1v1+m2v2.

According to Newton's second law,

FBA=pA'-pA/t=m1v1-m1u1/t.....(ii)

FAB=pB'-pB/t =m2v2-m2u2/t.....(iii)

From (i),(ii) and (iii),m1v1-m1u1/t=-m2v2-m2u2/t

⇒m1v1-m1u1=-(m2v2-m2u2)

 \Rightarrow m1v1+m2v2=m1u1+m2u2

 \Rightarrow Final momentum (pf) = Initial momentum (pi).

Thus, we conclude that during the interaction between the two balls, momentum before collision is equal to total momentum after collision. Thus, the momentum of the system is conserved in the absence of external forces.

35. (a) Evaporation

- (b) Sublimation
- (c) Filtration
- (d) Filtration
- (e) Magnetic separation.

OR

- (a) Saturated solution: In a given solvent when no more solute can dissolve further at a given temperature is called saturated solution.
 - (b) Pure substance: A pure substance consists of a single type of particles. E.g., gold, silver.

(c) Colloid: A colloid is a solution in which the size of solute particles are bigger than that of true

- solution. These particles cannot be seen with our naked eyes, they are stable, e.g., ink, blood.
- (d) Suspension: It is a heterogeneous mixture in which the solute particles are big enough to settle

5

down, e.g., chalk-water, paints, etc.

(e) Homogeneous mixture: Soda water, vinegar, filtered tea.

36. (a) Nucleus- contains genetic material, controls other organelles

1/2x5 points=5

- (b) Lysosomes -has digestive enzymes, they are suicidal bags
- (c) Vacuole They help in the storage and disposal of various substances.
- (d) Ribosomes -helps in protein synthesis

(e)Cell wall -protects cell and acts as semipermeable membrane.

OR

Ans : Differences between a plant cell and animal cell.

Plant cell	Animal cell
1. The cell wall is the outermost	1. The cell membrane or plasma
covering on the cell. The plant	membrane is the outermost
cells have both cell wall and the	covering of the cell. The animal
cell membrane	cells do not have cell wall
2. The vacuoles are large and	2. The vacuoles are small and
centrally placed.	uniformly distributed in the
	cytoplasm.
There are plastids in the plant	3. The plastids are absent in the
cells. The chloroplasts have	animal cells.
chlorophyll.	
4. The lysosomes are absent in	Lysosomes are present in the
the plant cells.	animal cells. They contain
	digestive enzymes.
The cytoplasm is thin and	5. The cytoplasm is dense and
pushed to the periphery due to	granular. It is uniformly spread
central vacuole.	throughout the cell.

Section-E

37. a. the magnitude of average velocity of an object equal to its average speed when an object moves in a straight line. 1+1+2

b. m/sec

Speed	Velocity
1. It is the distance moved by an object over a time interval.	1. It is the displacement of a given object over a time interval.
2. It does not have any direction only magnitude.	2. It has a specific direction and magnitude.
3. Speed cannot hold a negative value.	3. Velocity can hold a negative value
4. Speed = <u>Distance travelled</u> Time taken to travel that distance	4. Velocity = Displacement Time interval

8. (a) wind speed & temperature

- (b) Evaporation takes place at any temperature whereas boiling at boiling points or any other point
- (c) It takes latent energy of evaporation from the body in which it is kept

OR

The earthen pot is porous with lot of pores on it, the water oozes out through these pores and the water gets evaporated at the surface of the pot thereby causing cooling effect. This makes the pot cold and the water inside the pot cools by this process.

39. (a) Blood is circulated around the body through blood vessels by the pumping action of the heart. 1
(b) Plasma, which constitutes 55% of blood fluid, is mostly water, and contains

proteins, glucose, mineral ions, hormones, carbon dioxide and blood cells themselves.

(c) The blood cells are mainly red blood cells , white blood cells and platelets .RBC contains 2 pigment , haemoglobin.

OR

- 1. Blood delivers necessary substances such as nutrients .
- 2. Transports oxygen to the cells.
- 3. Transports metabolic waste products away from the cells .
- 4.Blood protects our body from infections.

====: BEST OF LUCK :=====

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