CBSE Class 09 Science

Sample Paper 01 (2020-21)

Maximum Marks: 80

Time Allowed: 3 hours

General Instructions:

i. The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
ii. Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple-choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
iii. Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.
iv. Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.
v. Section–D – question no. 34 to 36 are long answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
vi. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
vii. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. What is mass percentage of a solution?

OR

A hard substance when bent produces a tinkling sound. Predict its nature.

2. Which separation techniques will you apply for the separation of the iron pins from sand.
3. The plasma membrane is called semi-permeable:
   i. It allows the entry of selective substances.

ii. It does not allow entry of any substance.
iii. It allows the exit of selective substances.
iv. It allows entry only.

a. It does not allow entry of any substance and It allows the exit of selective substances are correct
b. All of these
c. It allows the entry of selective substances, It does not allow entry of any substance and It allows the exit of selective substances are correct
d. It allows the entry of selective substances and It allows the exit of selective substances are correct

4. Which organelle serves as a channel for transport of materials between cytoplasm and nucleus?
5. Suppose a ball of mass 'm' is thrown vertically upwards with an initial speed 'v', its speed decreases continuously till it becomes zero. Therefore, the ball begins to fall downward and attains the speed 'v' again before striking the ground. It implies that the magnitude of initial and final momenta of the ball are same. Yet, it is not an example of conservation of momentum. Explain why.
6. Name the two organelles that contain their own genetic material?

OR

Define diffusion.

7. Name any three diseases transmitted through vectors.
8. If an atom contains one electron and one proton, will it carry any charge or not?
9. Which organelle is involved in the formation of lysosomes?

OR

In brief state what happens when a **Red Blood Cell** is kept in a concentrated saline solution?

10. Salt can be recovered from its solution by evaporation. Suggest some other technique for the same?
11. What is the nature of the displacement time graph of a body moving with constant acceleration?

OR

What is the quantity which is measured by the area occupied below the velocity-time graph?

12. Name the enzyme present in tears which prevents eye infections.
13. Why do bicycles begin to slow down when we stop pedalling?
14. **Assertion:** The acceleration experienced by an object during free fall is dependent on its mass.
    Reason: All objects hollow or solid, big or small, should fall at the same rate.
    a. Both A and R are true and R is the correct explanation of assertion.
    b. Both A and R are true but R is not the correct explanation of assertion.
    c. A is true but R is false.
    d. A is false but R is true.
15. **Assertion:** We need to be happy in order to be truly healthy.
    Reason: Social equality and harmony are necessary for individual health.
    a. Both A and R are true and R is the correct explanation of assertion.
    b. Both A and R are true but R is not the correct explanation of assertion.
    c. A is true but R is false.
    d. A is false but R is true.

OR

Assertion: When there is a disease, either the functioning or the appearance of one or more systems of the body will change.
Reason: Signs of disease are the things we feel as being 'wrong' like headache, cough, or lose motions.

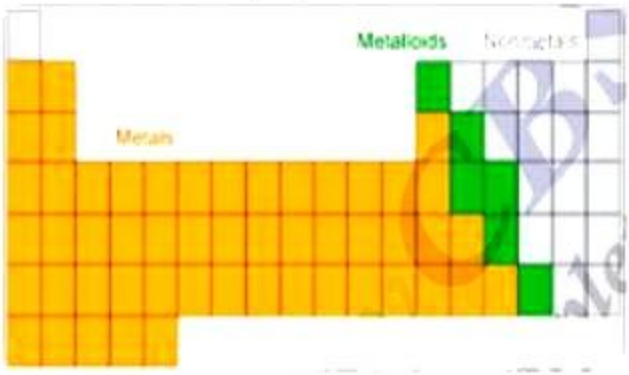
a. Both A and R are true and R is the correct explanation of assertion.
b. Both A and R are true but R is not the correct explanation of assertion.
c. A is true but R is false.
d. A is false but R is true.

16. **Assertion:** Rocket in flight is not an illustration of the projectile.
    Reason: Rocket takes flight due to combustion of fuel and does not move under the gravity effect alone.

a. Both assertion(A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
b. Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
c. Assertion (A) is true but reason (R) is false.
d. Assertion (A) reason (R) both are false.

17. **Read the passage and answer any four questions:**

An element as a basic form of matter that cannot be broken down into simpler substances by chemical reactions. Elements can be normally divided into metals, non-metals and metalloids. Examples of metals are gold, silver, copper etc. Examples of non-metals are hydrogen, oxygen, iodine etc. Some elements have intermediate properties between those of metals and non-metals, they are called metalloids. A compound is a substance composed of two or more elements, chemically combined with one another in a fixed proportion. The material obtained by the group I is a mixture of the two substances. The properties of the mixture are the same as that of its constituents.



i. Who was the first scientist to use the term elements?
   a. Antoine Laurent
   b. Robert Boyle
   c. Robert Brown
   d. none of these

ii. Which of the following property is not shown by metals
   a. malleability
   b. ductility
   c. poor conductor
   d. lustre

iii. is the only metal that is liquid at room temperature.

a. mercury
b. silver
c. copper
d. gold

iv. The colourless gas with the smell of rotten egg is found in
a. group I
b. group II
c. group III
d. group IV

v. The constituent of compounds are separated by
a. chemical reaction
b. electrochemical reaction
c. both (a) and (b)
d. none of these

18. **Read the passage and answer any four questions:**

The covering or protective tissues in the animal body are epithelial tissues. Epithelium covers most organs and cavities within the body. It also forms a barrier to keep different body systems separate. Epithelial tissue cells are tightly packed and form a continuous sheet. The skin, which protects the body, is also made of squamous epithelium. Skin epithelial cells are arranged in many layers to prevent wear and tear. This columnar epithelium facilitates movement across the epithelial barrier. In the respiratory tract, the columnar epithelial tissue also has cilia, which are hair-like projections on the outer surfaces of epithelial cells. Cuboidal epithelium forms the lining of kidney tubules.

i. While doing work and running, organs like hands, legs etc. move due to
a. Smooth muscles contract and pull the ligament to move the bones.
b. Smooth muscles contract and pull the tendons to move the bones.
c. Skeletal muscles contract and pull the ligament to move the bones.
d. Skeletal muscles contract and pull the tendon to move the bones.

Choose the correct option from the following
a. (I) and (II)
b. (II) and (III)
c. (III) and (IV)
d. Only (II)

ii. Identify the type of epithelial tissue shown in the following figure.

a. Squamous
b. Columnar
c. Cuboidal
d. Glandular

iii. Which cell is present in the inner lining of the intestine?
a. cuboidal epithelial
b. columnar epithelial
c. squamous epithelium
d. none of these

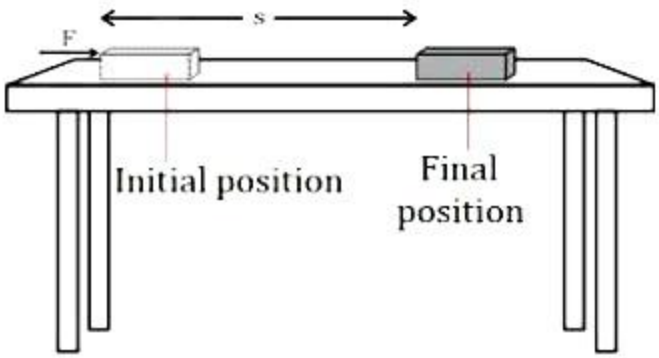
iv. The function of the cuboidal epithelium is:
a. provide mechanical support
b. excretion
c. absorption
d. all of these

v. Sometimes a portion of the epithelial tissue folds inward, and a multicellular gland is formed which is called:
a. squamous epithelium
b. glandular epithelium
c. cuboidal epithelium
d. columnar epithelial

19. **Read the passage and answer any four questions:**

All living beings need food. Living beings have to perform several basic activities to survive. The energy for these processes comes from food. All such activities require energy. In day-to-day life, we consider any useful physical or mental labour as work. Activities like playing in a field, talking with friends, humming a tune, watching a movie,

attending a function are sometimes not considered to be work. Push a pebble lying on a surface. The pebble moves through a distance. You exerted a force on the pebble and the pebble got displaced. In this situation, work is done. Thus, work done by a force acting on an object is equal to the magnitude of the force multiplied by the distance moved in the direction of the force.



i. A force of 5 N is acting on an object. The object is displaced through 2 m in the direction of the force, then work done is
   a. 10J
   b. 29J
   c. 30J
   d. 40J

ii. In case of negative work, the angle between the force and displacement is
   a. 0°
   b. 45°
   c. 90°
   d. 180°

iii. The work done on an object does not depend upon the
   a. displacement
   b. force applied
   c. angle between force and displacement
   d. initial velocity of the object

iv. The condition required to work to be done
   I. a force should act on object
   II. object must be displaced
   III. force should act perpendicular to the object
   IV. the object should not move

Choose the correct option among the following

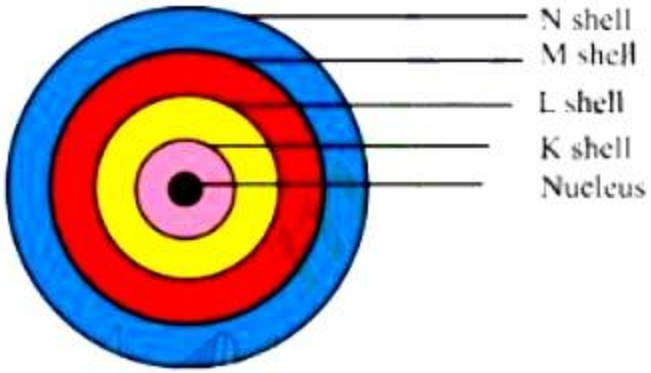
a. (I) and (III)
b. (I) and (II)
c. (II) and (III)
d. Only (IV)

v. Amount of Work done if force is perpendicular to the displacement is

a. 90 percent
b. 20 percent
c. zero work done
d. 100 percent

20. **Read the passage and answer any four questions:**

Only certain special orbits known as discrete orbits of electrons are allowed inside the atom. While revolving in discrete orbits the electrons do not radiate energy. Neutrons are present in the nucleus of all atoms, except hydrogen. In general, a neutron is represented as 'n'. The mass of an atom is therefore given by the sum of the masses of protons and neutrons present in the nucleus. The maximum number of electrons present in a shell is given by the formula $2n^2$, where 'n' is the orbit number or energy level index, 1, 2, 3... Electrons are not accommodated in a given shell unless the inner shells are filled.



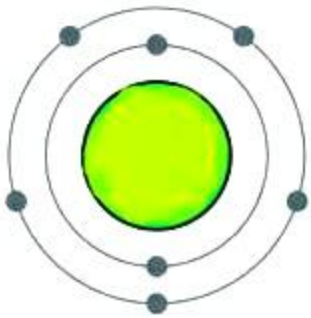
i. Who discovered a subatomic particle which had no charge and a mass nearly equal to that of a proton?

a. Ernest Rutherford
b. Thomson
c. J. Chadwick
d. Neils Bohr

ii. The maximum number of electrons that can be accommodated in the outermost orbit is

a. 8
b. 9
c. 5
d. 2

iii. Identify the element in the following figure.



a. Oxygen
b. Nitrogen
c. Hydrogen
d. Sodium

iv. Electronic configuration of phosphorus is
a. 2, 8, 1
b. 2, 8, 2
c. 2, 8, 5
d. 2, 7

v. The total number of the electron that can be accommodated in the third orbit or M-shell is
a. 18
b. 17
c. 16
d. 15

Section B

21. What is meant by sedimentation? Where this method is used?

OR

What is chromatography? Underline the basic principle involved in it. What are its various applications?

22. Calculate the molar mass of (a) water (H_2O) (b) nitric acid (HNO_3).
23. What are the colours absorbed by plants? The green light of the sunlight is blocked. How will the photosynthesis be affected?

OR

What would happen if the plasma membrane ruptures or breaks down?

24. Naveen was suffering from respiratory disorder since long time. His daughter Sarika took him to a doctor. After studying his case, the doctor came to know that Naveen was residing near a very busy road.
    i. What could be the possible reason for Naveen's respiratory disorder?
    ii. Which major pollutants are present in exhaust of vehicles?
    iii. Write the preventive measures that should be taken.
25. An athlete completes one round of a circular track of diameter 200 m in 40 s. What will be the distance covered and the displacement at the end of 2 minutes 20 s?
26. A force of 10 N displaces a body by a distance of 2 m at an angle 60^o to its own direction. Find the amount of work done.

Section C

27. What is the source of the centripetal force that a planet requires revolving around the Sun? On what factors does that force depend?

OR

How does the force of gravitation between two objects change when the distance between them is reduced to half?

28. Derive an expression for the potential energy of the body. Calculate P.E of body of mass 10 Kg at a height of 10 m.
29. A silver ornament of mass m gram is polished with a gold equivalent to 1% of the mass of silver. Compute the ratio of the number of atoms of gold and silver in the ornament.
30. How can we prevent influenza?
31. Which of the following electronic configurations is wrong and why?
    (a) 2, 8, 2
    (b) 2, 8, 8, 2

(c) 2, 8, 9, 1

32. Describe the microscopic structure of the cell.
33. Give an example of a body which may appear to be moving for one person and stationary for the other.

Section D

34. A 8000 kg engine pulls a train of 5 wagons, each of 2000 kg, along a horizontal track. If the engine exerts a force of 40000 N and the track offers a frictional force of 5000 N, then calculate:
    (a) the net accelerating force;
    (b) the acceleration of the train; and
    (c) the force of wagon 1 on wagon 2.

OR

What is a force? Explain its absolute and gravitational units. State the relation between them.

35. Describe the structure and function of different types of epithelial tissues. Draw the diagram for each type of epithelial tissue.
36. Calculate the formula unit masses of ZnO, Na_2O, K_2CO_3, given atomic masses of Zn = 65 u, Na = 23 u, K = 39 u, C = 12 u, and O = 16 u.

OR

Write an experiment to show that cathode rays travel in straight line?

CBSE Class 09 Science

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Solution

Section A

1. **Mass percentage of a solution** is defined as the mass of a solute (in grams) present in one hundred gram of a solution.
   Mass percentage = (Mass of solute / Mass of solution) x 100

   OR

   The hard substance is a metal. Actually metals are sonorous and produce tinkling sound when bent.

2. Magnetic separation : A magnet will attract iron pins and not sand particles
3. (d) It allows the entry of selective substances and It allows the exit of selective substances are correct
   Explanation: Cells are enclosed by a plasma membrane composed of proteins and lipids. It separates the contents of the cell from the external environment. It permits the entry of selective substances in the cell. It allows the exit of selective substances from the cell. The plasma membrane is therefore called a semi-permeable membrane.
4. Endoplasmic reticulum
5. Law of conservation of momentum is applicable to isolated system (no external force is applied). In this case, the change in velocity is due to the gravitational force of earth.
6. Chloroplast and Mitochondria.

   OR

   Movement of molecules from a region of their high concentration to a region of their low concentration is called diffusion.
7. Malaria, dengue and chikungunya are the three diseases transmitted through vectors.
8. An electron is a negatively charged particle, whereas a proton is a positively charged particle. The magnitude of their charges is equal. Therefore, an atom containing one electron and one proton will not carry any charge. Thus, it will be a neutral atom.
9. Golgi apparatus

OR

When a **Red Blood Cell** is kept in a concentrated saline solution, it loses water and leads plasmolysis in the RBC.

10. Salt can also be recovered from its solution by crystallization. Crystallization helps in obtaining pure crystals of a salt from its solution.
11. The graph is a parabola.

OR

The area occupied below the velocity-time graph measures the distance covered by any object.

12. Lysozyme present in tears which prevents eye infections.
13. This is because of the frictional forces acting opposite to the direction of motion. It is the result of the retarding action of friction.
14. (d) A is false but R is true.
    Explanation: The acceleration experienced by an object during free fall is independent of its mass. This means that all objects hollow or solid, big or small, should fall at the same rate.
15. (a) Both A and R are true and R is the correct explanation of assertion.
    Explanation: We need to be happy in order to be truly healthy, and if we mistreat each other and are afraid of each other, we cannot be happy or healthy. Social equality and harmony are therefore necessary for individual health.

OR

(c) A is true but R is false.
Explanation: When there is a disease, either the functioning or the appearance of one or more systems of the body will change and gives rise to symptoms and signs of disease. Symptoms of the disease are the things we feel as being 'wrong' like headaches, cough, or lose motions. These indicate that there may be a disease, but they don't indicate what the disease is.

16. (a) Both assertion(A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Explanation: Motion of rocket is based on action reaction phenomena and is governed by rate of fuel burning causing the change in momentum of ejected gas.

17. i. (b) Robert Boyle
    ii. (c) poor conductor
    iii. (a) mercury
    iv. (b) group II
    v. (c) both (a) and (b)
18. i. (d) Only (II)
    ii. (b) columnar
    iii. (b) columnar epithelial
    iv. (a) provide mechanical support
    v. (b) glandular epithelium
19. i. (a) 10J
    ii. (d) 180°
    iii. (d) initial velocity of the object
    iv. (b) (I) and (II)
    v. (a) zero work done
20. i. (c) J. Chadwick
    ii. (a) 8
    iii. (b) Nitrogen
    iv. (c) 2, 8, 5
    v. (a) 18

Section B

21. The process of setting of heavy solids at the bottom is called sedimentation. This method is used to seperate the components of a mixture of sand and water. It is seen that the sand and mud settle at the bottom with clear water above it. This is called sedimentation.

OR

Chromatography is a process of separation of different dissolved components of a mixture by adsorbing them over an adsorbent material like filter paper or alumina. Chromatography is used for separation of those components whose relative solubility in a solvent is different.

The basic principle in chromatography is that different solutes have different solubility in

the same solvent. E.g. If a spot of ink is taken on a paper and dipped in water then the coloured component which is more soluble in water rises faster. The other component which is less soluble remains at the bottom. Hence, the two components can be separated.

The various applications of chromatography are as follows:-

a. It is used to separate different colours in an ink or a dye.
b. It is used to separate pigments from natural colours.
c. It is used to separate drugs from blood.

22. (a) Water (H_2O)

Molar mass of H_2O

= (2 × Atomic mass of H) + (1 × Atomic mass of oxygen)

= (2 × 1u) + (1× 16u) = 18u.

(b) Nitric acid (HNO_3)

Molar mass of HNO_3

= (1 × Atomic mass of H) + (1 × Atomic mass of N) + (3 × Atomic mass of O)

= (1 × 1u) + (1 × 14u) + (3 × 16u) = 63u.

23. Plants absorb all the colours in the spectrum. The plants reflect back the green light because of which they appear green in colour. Therefore, photosynthesis will not be affected if green light is blocked.

OR

Plasma membrane is the selectively permeable membrane that surrounds the cell and allows the entry and exit of selected materials of the cell. If it ruptures, the contents of the cell will come in direct contact with the surrounding medium and not only unwanted material will be able to enter freely into the cell, but useful material will also find its way out of the cell easily. This will seriously disrupt the various metabolic activities of the cell and will result in its eminent death.

24. i. Air pollution.
ii. Carbon monoxide, carbon dioxides, nitrogen oxides and smoke.
iii. Use of fuel that burns completely, regularly PUC (pollution under control) to be checked of all the vehicles.

25. Given

Diameter of circular track, 2r = 200 m

Circumference of circular track = $2\pi r$

S = $2\pi r = \frac{22}{7} \times 200 = \frac{4400}{7} m$

Time for completing one round = 40 s.

Time for which the athlete ran = 2 min and 20 s = 140 s.

Now distance covered by the athlete in 40 s

$S = \frac{4400}{7} m$

i) Therefore, distance covered by athlete in 140 s= $\frac{4400}{7} \times \frac{140}{40}$ = 2200 m

ii) As the athlete returns to the initial point in 40 s, this displacement = 0

Now

Number of rounds in 40 second = 1

Hence number of rounds in 140 s is = $\frac{140}{40} = 3.5$

For each complete round the displacement is zero.

Therefore for 3 complete rounds, the displacement will be zero.

The final displacement will be due to half the round.

In half round distance covered = half of circumference.

Thus, his displacement = diameter of circular track = 200 m

Displacement after 140 s = 200 m

26. By definition: Work = Force $\times$displacement in the direction of force = Fs cosθ

Given : F = 10 N, s = 2 m, θ = 60°

Therefore W = 10 × 2 × cos 60° = 10 $\times$ 2 $\times \frac{1}{2}$ = 10 J

Section C

27. The gravitational force is the source of centripetal force that a planet requires to revolve around the sun. This force depends on the masses of the Sun and the planet and on distance between them.

OR

According to universal law of gravitation,the gravitational force of attraction between any two objects of mass is proportional to the product of the masses and inversely proportional to the square of the distance between them.Hence if the distance is reduced to half,then the gravitational force becomes four times larger than the previous value.

28. Potential energy of a body of mass = m Kg at a height = h m from the ground.
    Gravitational force of attraction on the body = mgh N
    In order to lift this body at h meters above the ground force applied = mg N
    Distance moved by force = h m
    Work done in lifting the body from a to B = Force × Distance
    = mg × h = mgh
    Energy spent in lifting the body to height 'h'. As energy cannot be destroyed, this energy gets stored in the body as its potential energy
    m = 10 Kg
    g = $9.8 m/s^2$
    h = 10 m
    P. E = mgh
    = 10 × 10 × 9.8
    = 980 Joules
29. Given, Mass of silver = m g
    Mass of gold = 1% of the mass of Ag = $\frac{m}{100}$ g
    Number of atoms of silver = $\frac{Mass\ of\ silver}{Atomic\ mass\ of\ silver} \times N_A = \frac{m}{108} \times N_A$
    Number of atoms of gold = $\frac{m}{100 \times 197} \times N_A$
    Ratio of number of atoms of gold to silver in ornament = Number of atoms of Au : Number of atoms of Ag = $\frac{m}{100 \times 197} \times N_A : \frac{m}{108} \times N_A = 108 : 100 \times 197 = 108 : 19700 = 1 : 182.41$
    Therefore, Ratio of number of atoms of gold to silver in ornament = 1 : 182.41
30. Influenza is an air borne disease, so it is prevented by keeping away from the patients.
31. Electronic configuration 2, 8, 9, 1 is incorrect because after filling 8 electrons in third shell, the next two electrons fill the fourth shell to maintain the stability of the atom. Electronic configurations (a) 2, 8, 2 and (b) 2, 8, 8, 2 are correct.
32. The cork cells were the first cells to be observed. They were composed of box-like compartments, forming a honeycomb structure. Cell organelles are found embedded in the cytoplasm.These are smaller in size and bounded by plasma membrane.
33. The passengers in a moving bus observe that the trees, buildings as well as the people on the roadside appear to be moving backwards. Similarly, a person standing on the roadside observes that the bus (along with its passengers) is moving in forward direction.

But, at the same time, each passenger in a moving bus or train observes, his fellow passengers sitting and not moving. Thus, we can also say that motion and rest are relative.

Section D

34. Force exerted by the engine,F' = 40,000 N

    Frictional force offered by the track in the direction opposite of the motion,F'' = -5,000 N

    a. The net accelerating force, F = F'+F''= 40,000 N + (-5,000 N) = 35,000 N

    b. Mass of each wagon of the train = 2000 kg

       Number of wagons = 5

       Therefore, Mass of the train,m= 2,000 kg $\times$ 5= 10,000 kg.

       Net accelerating force acting on the train,F= 35000 N

       From Newton's second law of motion, acceleration

       $a = \frac{F}{m} = \frac{35{,}000\ N}{10{,}000\ kg} = 3.5\ ms^{-2}$

    c. Mass of 1 wagon= 2000 kg

       acceleration of the train= 3.5 ms^{-2}

       From the relation,F =ma,we get

       F= 2000 kg $\times$ 3.5 ms^{-2}

       F= 7000 N

       Force exerted by wagon 1 on wagon 2

       = Net accelerating force - Force acting on wagon 1= 35000 N - 7000 N= 28000 N

       Therefore,the required answer is 28000 N

OR

Force: Push or pull of an object is considered a force. Example: to open a door, either we push or pull it. A drawer is pulled to open and pushed to close.

Absolute system of unit: A system of physical units (as cgs units) based on a unit of a force independent of the value of the acceleration of gravity.

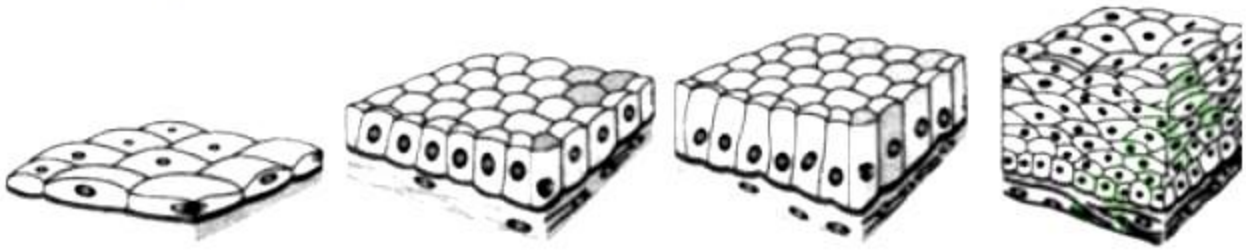
Gravitational system of units: A system of physical units based upon a unit of force that is the weight of a unit mass under a specified standard of gravity.

For example, the Absolute unit of force is Newton (N) and the gravitational unit of force is kilogram weight (kg wt).

1 kg wt = 9.8 N

35. Epithelial tissues can be (A) Squamous epithelium (Either simple squamous epithelium or

stratified squamous epithelium) (B) Columnar epithelium (C) Cuboidal epithelium or (D) Glandular epithelium



The structure and function of different types of epithelial tissues are as follows:-

A. Squamous epithelium can be of two types:-
   a. Simple squamous epithelium: Simple squamous epithelial cells are a simple flat kind of epithelium. They are extremely thin and flat. They form a delicate lining. They are present in the lining of the blood vessels or the alveoli (in lungs) where transportation of substances occurs through a selectively permeable membrane. They are also present in the esophagus and the lining of the mouth are also covered with this type of cells.
   b. Stratified squamous epithelium: Stratified squamous epithelial cells are arranged in a pattern of layers. E.g. Skin epithelial cells are arranged in many layers to prevent wear and tear.

B. Columnar epithelium: Columnar epithelial cells are present where absorption and secretion occur as in the inner lining of the intestine. These cells are long or columnar (pillar-like). They facilitate movement across the epithelial barrier. In the respiratory tract, the columnar epithelial tissue has hair-like projections (cilia) on the outer surfaces of epithelial cells. The movement of the cilia pushes the mucus forward and clears it.

C. Cuboidal epithelium: Cuboidal epithelium is made up of cube-shaped cells which provide mechanical support. They form the lining of the kidney tubules and ducts of salivary glands.

D. Glandular epithelium: A multicellular gland or glandular epithelium is formed when a portion of the epithelial tissue folds inward and a multicellular gland is formed. An epithelial cell sometimes acquires additional specialisation as a gland cell. Gland cells can secrete substances at the surface of the epithelium.

36. Given atomic masses of Zn = 65 u, Na = 23 u, K = 39 u, C = 12 u, and O = 16 u.

Formula unit mass of:

i. ZnO = Atomic mass of Zn + atomic mass of O

= (65 + 16) u = 81 u

ii. Na_2O =Atomic mass of Na + atomic mass of O

= (23×2)+16= 46 + 16 = 62 u

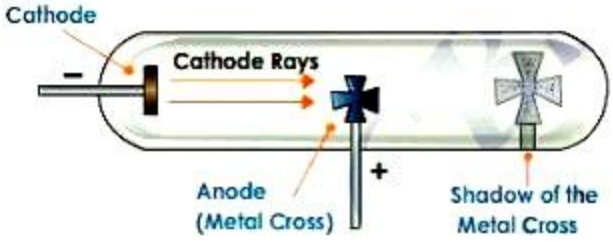
iii. K_2CO_3= Atomic mass of K_2 + Atomic mass of C + Atomic mass of O

= (39×2) + 12 + (16×3)= 78 + 12 + 48 = 138 u

OR

Experiment to show that cathode rays travel in the straight line:-

a. Take a discharge tube coated with a fluorescent substance
b. Place an opaque object in the path of the cathode rays.
c. When cathode rays were made to pass through the discharge tube then discharge the glowed wherever cathode rays fall except in the region of the shadow of the opaque object.
d. The above experiment shows that cathode rays travel in the straight line.



Cathode Rays Cast Shadows of the Objects Placed in their Path