



ITL PUBLIC SCHOOL ANNUAL EXAMINATION (2023-24)

Date: 16.2.24

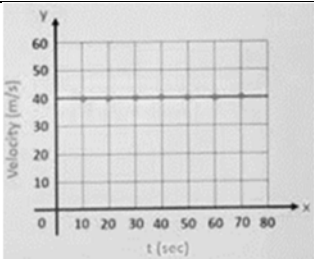
ANSWERKEY
SCIENCE(086)- SET A


Class: IX

Time: 3 hrs

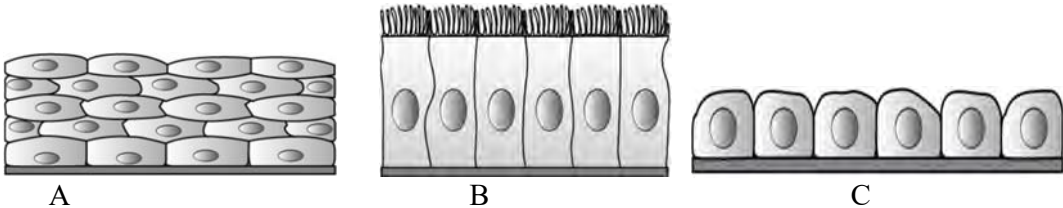
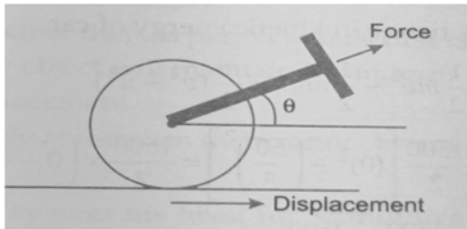
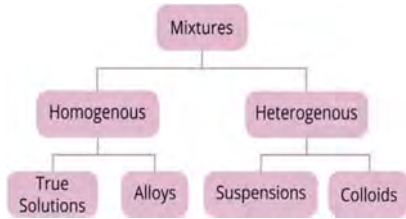
M. M: 80

	SECTION - A	
1	Two substances, A and B were made to react to form a third substance, A_2B according to the following reaction: $2A + B \rightarrow A_2B$. What is the atomicity of the product formed? 3	1
2	An atom has 15 protons, 15 electrons and 16 neutron. What is the atomic number and mass number of that element? Atomic number =15, mass number = 31	1
3	Identify the Mg^{2+} ion from the given structures where, n and p represent the number of neutrons and protons respectively. A	1
4	Arrange salt, oxygen, milk in correct order of inter particle spaces present in the matter. Salt<milk<Oxygen	1
5	What will be the valency of the element given in the following figure: Ans: 2	1
6	Tyndall effect is observed in starch solution but not in salt solution. Give reason. Particle size is very small in case of salt solution to scatter the beam of light.	1
7	Which of the following is an example of chemical change and physical change? a) Ripening of fruits - Chemical b) Melting of wax – Physical	1
8	A solution contains 30g of common salt in of 90g water. Calculate the concentration in terms of mass by mass percentage of the solution. $30/120 * 100 = 25\%$	1
9	Two velocity-time graphs are given. Which of the two represents higher acceleration? Give reason for your answer. Both have same acceleration as lines have same slope being parallel lines	1
10	Why does a fielder pull his hands backward while catching a fast moving ball? According to 2nd law , $F \propto 1/t$; t increases and f decreases	1
11	A person takes concentrated solution of salt. After sometime he started vomiting. What is the phenomenon responsible for this? – hypertonic solution causes exosmosis in stomach	1
12	Name the outermost waxy coating present on leaves . Cuticle 1	1
13	Identify the type of animal tissue given in the diagram. Cardiac muscle cells	1
14	A soil sample has adequate water holding capacity but is deficient in phosphorous and potassium. Suggest any one practice that would improve the quality of crops grown in that field?- use of urea	1
15	What is the location of the following tissues in the human body – smooth muscles , cartilage ? Internal organs , ear/nose/end of bones/tracheal rings 0.5 0,5	1
16	Identify the activities on the basis of voluntary or involuntary muscles: a) Movement of food in intestine INV b) Writing with hand – VOL 0.5 0,5	1

Question no.17-20 are Assertion – Reason questions .Each question consists of an assertion A and a reason R for the same. Identify the correct option. a)A and R are true And R is correct explanation of A. b)A and R are true but R is not the correct explanation of A c) A is true but R is False d) A is false and R is true											
17	Assertion(A) : Rudolf Virchow modified the hypothesis of cell theory given by Schleiden and Schwann. Reason(R) : Rudolf Virchow suggested that all cells arise from pre-existing cells (a)	1									
18	Assertion(A): Uniform circular motion is an accelerated motion. Reason(R): In circular motion magnitude of velocity is constant but direction of motion is continuously changing so the velocity is changing with time. A	1									
19	Assertion(A): A sound of high pitch is said to be shrill Reason(R): Pitch of a sound increases on increasing its frequency B	1									
20	Assertion(A): In Rutherford's experiment, most of the alpha particles crossed the gold foil without getting deflected Reason(R): Most of space inside an atom is empty. A	1									
SECTION - B											
21	Name the following and give one characteristic feature of following tissues: a) Living tissue that stores food in plants - parenchyma ,thin walled b) a connective tissue in humans with fluid matrix – blood , living cells in fluid matrix 1	2									
22	Mention one exotic and one indigenous breed of Poultry birds. - leghorn ,aseel OR List two living conditions to keep the cattle healthy. – slant floor , ventilation 1, 1	2									
23	A farmer in town X changed the cropping pattern of the farm. Earlier the farm had only one crop soya bean but then the farm was divided into rows of different crops. Two rows of soya bean and alternate two rows had maize and the next two had cowpea. a) Name the cropping pattern used in above case.- intercropping b) Mention two advantages of this new cropping pattern – controls disease spread , variety of crops	2									
24	The velocity-time graph shows the motion of a car.Find it's a) acceleration b) velocity c) distance covered in 30 seconds. a=0 as velocity is constant (0.5) V=40m/s (0.5) ; distance = 40 x 30 =1200m (1)										
25	How is mass different from weight of an object? Give two points to justify. <table border="1" data-bbox="883 1444 1349 1629"> <thead> <tr> <th></th><th>Mass</th><th>Weight</th></tr> </thead> <tbody> <tr> <td>i.</td><td>Mass is the quantity of matter contained in an object.</td><td>Weight is the force with which the earth attracts an object.</td></tr> <tr> <td>ii.</td><td>Mass remains same everywhere.</td><td>Weight of a body keeps on changing from place to place.</td></tr> </tbody> </table>		Mass	Weight	i.	Mass is the quantity of matter contained in an object.	Weight is the force with which the earth attracts an object.	ii.	Mass remains same everywhere.	Weight of a body keeps on changing from place to place.	2
	Mass	Weight									
i.	Mass is the quantity of matter contained in an object.	Weight is the force with which the earth attracts an object.									
ii.	Mass remains same everywhere.	Weight of a body keeps on changing from place to place.									
26	Composition of the nuclei of two atoms X and Y are given as under <table data-bbox="298 1671 586 1766"> <tr> <td></td><td>X</td><td>Y</td></tr> <tr> <td>Protons</td><td>6</td><td>6</td></tr> <tr> <td>Neutrons</td><td>6</td><td>8</td></tr> </table> Give the mass number of X and Y. Name and Define the relation between the two species? X=12, Y=14 X and Y are isotopes of each other, same atomic number but different atomic masses OR How isotopes are different from isobars? Give example to explain your answer. Isotopes are atoms of the same element with the same atomic number but a different mass number.		X	Y	Protons	6	6	Neutrons	6	8	2
	X	Y									
Protons	6	6									
Neutrons	6	8									

	Isobars are atoms of various elements that have the same mass number but a different atomic number.	
	SECTION - C	
27	<p>A playing card was placed over an empty glass tumbler as shown. A one rupee coin was placed over the card and then the card was flicked with a push.</p> <p>a) What will you observe after the flick? Coin drops in glass b) State the law involved in the above case. inertia of rest c) What will be your observation if the above coin is replaced with a heavier five rupee coin? It will also fall in glass</p> 	3
28	<p>Define Potential energy. Calculate the potential energy of a 40Kg mass raised to a height of 5m above the ground. Energy possessed due to position wrt surface of earth or its shape and configuration (1) PE=mgh = 40 x 10 x 5 =2000J (2)</p>	3
29	<p>a) If bromine atom is available in the form of say, two isotopes- $^{79}\text{Br}_{35}$ (49.7%) and $^{81}\text{Br}_{35}$ (50.3%), calculate the average atomic mass of bromine atom. The average atomic mass of bromine atom</p> $= \left(79 \times \frac{49.7}{100} \right) + \left(81 \times \frac{50.3}{100} \right)$ $= 39.263 + 40.743$ $= 80.006 \text{ u}$ <p>b) What are the limitations of Rutherford's model of the atom? According to Rutherford's model of an atom the electrons are revolving in a circular orbit around the nucleus. Any such particle that revolves would undergo acceleration and radiate energy. The revolving electron would lose its energy and finally fall into the nucleus, the atom would be highly unstable. But we know that atoms are quite stable.</p> <p style="text-align: center;">OR</p> <p>An element X has electronic configuration = 2,8,1. a) Write its atomic number. 11 b) Calculate its valency. 1 c) One electron is present in the outer most shell of the atom of an element X. What would be the nature and value of charge on the ion formed if this electron is removed from the outer most shell? $\text{X} - \text{e}^- \rightarrow \text{X}^+$. The ion formed by loss of one electron will have positive nature and one positive (+1) charge on the cation formed.</p>	3
30	<p>Differentiate between meiosis and mitosis on the basis of-</p> <p>a) number of daughter cells produced - 4,2 b) number of chromosomes in daughter cells - haploid , diploid c) purpose of this cell division - gamete formation , growth</p>	3
31	<p>Draw a neat diagram of a plant cell and label in it the following: 1.5 diag 0.5 each for labelling</p> <p>a) organelle that generates energy b) organelle that synthesizes proteins c) organelle involved in storage of cell sap</p> <p style="text-align: center;">OR</p> <p>Draw a labelled diagram of a plastid and label the parts -grana , stroma , DNA 1.5 diag 0.5 each for labelling</p>	3
32	<p>a) State the universal law of gravitation. Newton's Law of Universal Gravitation states that every particle attracts every other particle in the universe with force directly proportional to the product of the masses and inversely proportional to the square of the distance between their centres.(1) b) The force of gravitation between two masses is 100N. Show mathematically that what will be the new force if i) both the masses are doubled force quadruples = 400N (1) ii) distance between them is doubled force becomes 1/4 times =25N (1)</p>	3

33	<p>a) We should wear cotton clothes in summers. Give reason. Cotton absorbs sweat and evaporation of sweat causes cooling.</p> <p>b) Suggest a method to liquefy atmospheric gases. Increasing pressure/compressing or cooling</p> <p>c) Why we are able to smell hot sizzling food several meters away? Diffusion, due to more kinetic energy of particles</p>	3
SECTION - D		
34	<p>a) Define atomicity. No. of atoms in a molecule</p> <p>b) What is the atomicity of SO_4^{2-} and CO_3^{2-}? 5 and 4</p> <p>c) Give the names of the elements present in the following;</p> <p>i) Hydrogen bromide – H, Br ii) Potassium sulphate – K, S, O</p> <p>d) Write one point of difference between a molecule of an element and a molecule of a compound with an example. Molecules of elements have same type of atoms, ex. O_2 but molecules of compounds are made of atoms of different elements, ex. HCl.</p> <p style="text-align: center;">OR</p> <p>a) Calculate the molecular mass of the following substances:</p> <p>i) Ethyne, C_2H_2 = 26amu ii) Sulphur molecule, S_8 = 256amu [atomic mass of $\text{H}=1$, $\text{C}=12$, $\text{S}=32$]</p> <p>b) Write down the names of the compounds represented by the following formula:</p> <p>i) KNO_3 = Potassium nitrate ii) CaCl_2 = Calcium chloride iii) MgO = Magnesium oxide</p>	5
35	<p>a) What are the types of food requirements of dairy animals? –roughage . concentrates explanation 1,1</p> <p>b) How do external and internal parasites can be fatal for cattle? Deadly Diseases caused by them 1</p> <p>c) Mention one exotic and one indigenous breed of cow. Sahiwal 1Jersey 1</p> <p style="text-align: center;">OR</p> <p>a) Five or six fish species are cultured together in a single pond. What is this system of fish culture called as? Composite fish culture 1</p> <p>b) How are different species for above type of culture selected? Different feeding habits 1 explanation 1</p> <p>c) Mention the problem associated with this system and also explain how this problem can be solved. Seeds not available except monsoon 1 hormonal stimulation 1</p>	5
36	<p>a) Give two medical uses of ultrasound (1)Ultrasound is an imaging test that utilizes sound waves to generate a picture of organs and tissues in the body. (2) It is used to examine the fetus during pregnancy and monitor the health of the developing baby. (2)</p> <p>b) Why are the ceilings of concert halls and cinema halls curved?so that sound after reflection reaches all corners of the hall(1)</p> <p>c) A person shouts near a wall and heard the echo after 10 sec. What is the distance of the wall from the person? (take speed of sound=346 ms^{-1}) $v=2d/t$; $d=vt/2=346 \times 10/2 = 1730\text{m}(2)$</p> <p style="text-align: center;">OR</p> <p>a) What is reverberation of sound? Reverberation is the persistence of sound after it has been stopped due to multiple reflections from surfaces (1)</p> <p>b) Suggest two arrangements that should be made in auditorium to control excessive reverberation. The reverberation can be reduced by covering the ceiling and walls of the enclosed space with sound absorbing materials, such as fibre board, loose woolens, etc.(2)</p> <p>c) A bat can hear the sound upto frequency 120KHz.Determine the wavelength of the sound wave.Given the speed of sound in air is 344m/s. (2)</p>	5

	SECTION-E	
37	<p>With reference to the given paragraph answer the questions based upon related concepts – <i>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. The skin, the lining of mouth, lining of blood vessels, lung alveoli, kidney tubules are all made up of epithelial tissues.</i></p> <div style="text-align: center;">  <p>A B C</p> </div> <p>a) Name the type of epithelial tissue from the given diagrams A,B,C which help in the movement of particles such as mucus out of the respiratory tract and how? B 0.5 , ciliated epithelium 0.5</p> <p>b) How is glandular epithelium formed? –inward turning and cells modified to form goblet cells 1</p> <p>c) Skin is made up of a specialized squamous epithelium. What is this epithelium called as and what is its advantage? Stratified epithelium 0.5 , prevents wear and tear 0.5</p> <p>d) Which type of epithelium is present in ducts of salivary glands? –cuboidal epithelium 1</p>	4
38	<p>With reference to the given paragraph answer the questions based upon related concepts –</p> <p><i>In many situations , the motion of the object is at some angle to the applied force.</i> <i>When a gardener pulls a lawn roller by applying force on its handle, the roller moves horizontally on the lawn.</i></p> <div style="text-align: center;">  </div> <p>a) Amit applies force to displace a large box from its position. He tries hard but is unable to displace the box. How much work is done by Amit and why? Zero,no displacement (0.5 +0.5)</p> <p>b) Radha covered a distance of 1.5km from market to her home with a bag containing vegetables in her hand. What is the work done by Radha and why? Zero, F and s are perpendicular (0.5 +0.5)</p> <p>c) A car is running on the road and suddenly the driver applies brakes to stop the car. What is the nature of work done by the braking force and why? Negative as friction and displacement are opposite(0.5 +0.5)</p> <p>d) What happens to the kinetic energy of the car when it stops? Converts into heat (1)</p>	4
39	<p>With reference to the given paragraph answer the questions based upon related concepts – <i>Mixtures are constituted by more than one kind of pure form of matter, known as a substance. Depending upon the nature of the components that form a mixture, we can have different types of mixtures i.e., homogeneous and heterogeneous mixtures.</i></p> <div style="text-align: center;">  </div> <p>a) A student mixed a spoon of sugar in 50ml of water in a test tube. What type of mixture will be formed inside the test tube? Homogeneous</p> <p>b) Classify the following into mixture and compound: common salt- Compound, air- Mixture</p> <p>c) How will differentiate a true solution from suspension on the basis of filtration? Suspension could be filtered</p> <p>d) State one difference between homogeneous and heterogeneous mixture. Any1</p>	4