



# ITL PUBLIC SCHOOL ANNUAL EXAMINATION (2022-23)

Date: 10.2.23

Class: IX

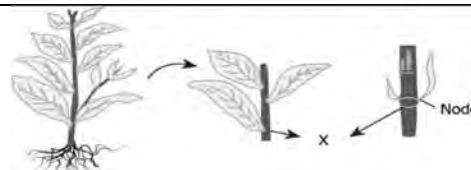
SCIENCE(086) – SET A

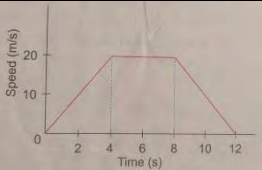
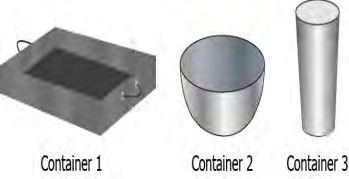
ANSWER KEY

Time: 3 hrs

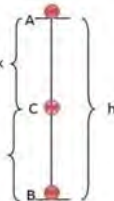
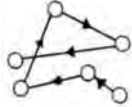
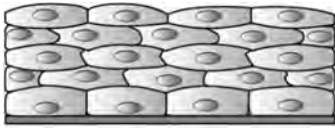


M. M: 80

SECTION-A												
1	Draw velocity- time graph for an object under non-uniform retardation. <b>Slant line coming down.</b>	1										
2	Two objects of masses 10kg and 15 kg are identical in shape and size, which has more inertia? <b>15kg</b>	1										
3	Why does the dust fly off, when a carpet is hit with a stick? <b>Inertia of rest.</b>	1										
4	A force of 50 N is applied on an area of 0.2 m <sup>2</sup> .What is the pressure exerted? <b>250 Pa.</b>	1										
<b>OR</b>												
	Define the S.I. unit of pressure. <b>When 1 N of force is exerted on 1 m<sup>2</sup> area.</b>											
5	What is the frequency of a sound wave whose time period is 0.05 s? <b>20 Hz.</b>	1										
6	Name any one device which work on the reflection of sound. <b>Stethoscope.</b>											
7	Ravi wants to wear his favorite shirt to a party but the problem is that it is still wet after a wash. What would he do to dry it fast? <b>Spread the shirt under fan/ dry in sun any one 1mk</b>	1										
8	With reference to the metals and non-metals name the following- a) a soft metal that can be cut by knife <b>K/Na ½</b> b) the element present in diamond. <b>C ½</b>	1										
9	An element X has 3 shells and the valence shell has 2 electrons. What will be its valency ? <b>2 - 1mk</b> <b>OR</b> What are polyatomic ions? Give an example. <b>Defn ½ , example ½</b>	1										
10	A student puts one drop of food colour in 100 ml water. The student notices that the food colour gradually spreads in the water. What is the possible reason for this phenomenon? <b>Diffusion 1</b>	1										
11	How many elements are present in one formula unit of Al(OH) <sub>3</sub> ? <b>Al,O,H /three ½ ½</b>	1										
12	The atomic number of some elements is shown- <table border="1" style="width: 100%;"><tr><td>Element</td><td>Atomic number</td></tr><tr><td>A</td><td>4</td></tr><tr><td>B</td><td>9</td></tr><tr><td>C</td><td>12</td></tr><tr><td>D</td><td>14</td></tr></table> Which element/elements will have the valency of 2? <b>A,C ½ , ½</b>	Element	Atomic number	A	4	B	9	C	12	D	14	1
Element	Atomic number											
A	4											
B	9											
C	12											
D	14											
13	Identify the activities on the basis of voluntary or involuntary muscles: a) Movement of food in intestine b) Writing with hand <b>a Involuntary .5, b voluntary .5</b>	1										
14	Town X is situated at the banks of a river. Due to inadequate release from the reservoir, often the agricultural farms of the town suffer from crop failures. Which type of irrigation would be suitable for town X? <b>River lift system 1</b> <b>OR</b> Dwarfness is a desired feature in cereal crops. How does it help to increase productivity of crop? <b>More nutrients are stored in grains 1</b>	1										
15	Which organelle serves as a channel for transport of materials between cytoplasm and nucleus? <b>Endoplasmic reticulum 1</b>	1										
16	The image shows the stem of a plant. Which type of meristematic tissue is present at the labelled part 'X'? Write its function. <b>Intercalary .5, internodal growth .5</b>	1										
17	Chromosomes are called as heredity material. Why? <b>Transfer the characters from parents to offsprings 1</b>	1										
<b>Question no. 18 -20 are Assertion-Reasoning based questions.</b>												



	<p><b>These consists of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below.</b></p> <p>(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 but R is true</p>										
18	<p><b>Assertion (A)</b>-Different type of crops required different photoperiods.  <b>Reason (R)</b>- Growth of plants and flowering are important functions which depend upon sunlight</p>	1									
19	<p><b>Assertion (A)</b>-Nucleons refer to the number of subatomic particles present in the nucleus.  <b>Reason (R)</b>-Protons are responsible for the positive charge of the nucleus.</p>	1									
20	<p><b>Assertion (A):</b> If the displacement of a body is zero, the distance covered by it may not be zero.  <b>Reason(R):</b> Distance is a vector quantity, displacement is a scalar quantity. C</p>	1									
<b>SECTION -B</b>											
21	<p>Using the speed time graph given below:</p> <p>a) Find the acceleration produced during the journey. <b>5m/s<sup>2</sup></b>  b) Find the distance covered during the accelerated motion. <b>40 m.</b></p>	2									
											
22	<p>A man claps his hands near a mountain and hears the echo after 4 seconds. If the speed of sound under these conditions be 330 m/s, calculate the distance of mountain from the man. <b>660 m.</b></p>	2									
23	<p>Composition of the nuclei of two atomic species A and B are given as under-</p> <table border="1" data-bbox="203 898 467 1075"> <tr> <td></td><td>A</td><td>B</td></tr> <tr> <td>Protons</td><td>16</td><td>16</td></tr> <tr> <td>Neutrons</td><td>16</td><td>18</td></tr> </table> <p>Give the mass number of A and B . What is the relation between the two species?  <b>A= 32,B=34 ½ ½    Isotopes 1</b></p>		A	B	Protons	16	16	Neutrons	16	18	2
	A	B									
Protons	16	16									
Neutrons	16	18									
24	<p>A student has four containers of different shapes and sizes but made of steel.  He adds 200 mL water to each container and places them on equal heat.  In which container the evaporation of water would be the fastest? Give reason for your answer. <b>Container 1 ,surface area is more 1</b></p>	2									
											
25	<p>Name the following and give one characteristic feature of following tissues:</p> <p>a) Living tissue that stores food in plants    b) Tissue present in bark of tree  <b>a) parenchyma, thin cell wall    1,    b) cork, suberin in walls    1</b></p>	2									
26	<p>What are the consequences of the following conditions?</p> <p>a) A plant cell containing higher water concentration than the surrounding medium.  b) An animal cell containing lower water concentration than the surrounding medium.  <b>a) plasmolysis    1    b) cell swells and bursts    1</b></p>	2									
<b>SECTION-C</b>											
27	<p>The velocity of a body of mass 10 kg increases from 5 m/s to 8 m/s when the force acts on it for 2 seconds.</p> <p>a) What is the momentum before the force acts? <b>50kg m/s.</b>  b) What is the momentum after the force acts? <b>80 kg m/s.</b>  c) What is the gain in momentum per second? <b>15 kg m/s</b></p>	3									
28	<p>Define kinetic energy. Derive the formula for kinetic energy. <b>Definition (1) derivation (2)</b></p>	3									
29	<p>What conclusions were drawn by Rutherford on the basis of following observation</p> <p>a) Most of the alpha particles passed through gold foil without any deviation.  b) Few alpha particles were deflected through small angles.  c) Very few alpha particles bounced back.</p>	3									

30	Tabulate the differences in the characteristics of the three states of matter on the basis of shape, rigidity ,intermolecular spaces. <b>Difference 1,1,1</b> <b>OR</b> Give reason for the following observations. a) Naphthalene balls disappear with time without leaving any solid. <b>Sublimation 1</b> b) We can get the smell of perfume sitting several metres away. <b>Diffusion 1</b> c) Ice at 273 K more effective in cooling than water at the same temperature. <b>Latent heat of fusion 1</b>	3								
31	Draw a neat diagram of a plant cell and label in it the following: a) organelle that generates energy      b) organelle that synthesizes proteins c) organelle involved in storage of cell sap. <b>Diagram 1.5 labelling 1.5</b> <b>OR</b> Draw a labelled diagram of plastid. Also mention the three types of plastids. <b>Diagram 1.5, chloroplast, chromoplast, leucoplast 1.5</b>	3								
32	A farmer in town X changed the cropping pattern of the farm. Earlier the farm had only soyabean but then the farm was divided into rows of different crops. Two rows of soyabean and alternate two rows had maize and the next two had cowpea. a) Name the cropping pattern used in above case. <b>Intercropping 1</b> b) Mention two advantages of this new cropping pattern. <b>Controls pests, utilization of all nutrients in soil 1+1</b>	3								
33	Differentiate between bone and cartilage with respect to their structure, function and location. <b>Three differences 1+1+1</b> <b>Hard, soft      forms structural framework, provides flexibility      skeleton,ear lobes</b>	3								
<b>SECTION-D</b>										
34	a) Define acceleration due to gravity. <b>Definition 1 mark</b> b) Derive an expression to show that acceleration due to gravity does not depend upon the mass of the object? <b><math>g=Gm/R^2</math> 2 marks</b> c) A stone is dropped from the top of a 40 m high tower. Calculate its speed after 2 s. Also find the speed with which the stone strikes the ground. <b><math>v=20m/s</math> <math>v=20\sqrt{2}m/s</math> 1 each</b>	5								
35	a) The average atomic mass of a sample of an element X is 16.2 u. What are the percentages of isotopes $^{16}_8X$ and $^{18}_8X$ in the sample? <b>Let the percentage of <math>^{16}_8X</math> be x and the percentage of <math>^{18}_8X</math> be 100 – x.</b> $\therefore \left(16 \times \frac{x}{100}\right) + \frac{18(100-x)}{100} = 16.2$ $\frac{16x}{100} + \frac{1800-18x}{100} = 16.2$ $\therefore \frac{16x-18x+1800}{100} = 16.2$ $\therefore -2x+1800 = 16.2 \times 100$ $\therefore -2x = 1620-1800$ $\therefore -2x = -180$ $\therefore x = \frac{180}{2} = 90$ $\therefore \quad \quad \quad ^{16}_8X = 90\%$ <p><b>and</b> <math>\quad \quad \quad ^{18}_8X = 10\%</math></p> b) A student learns that aluminum forms compound with chlorine and oxygen. She records the valencies of the three elements. <table border="1"><thead><tr><th>Element</th><th>Valency</th></tr></thead><tbody><tr><td>Aluminum</td><td>3+</td></tr><tr><td>Chlorine</td><td>1</td></tr><tr><td>Oxygen</td><td>2-</td></tr></tbody></table> What will be the chemical formula of aluminium oxide and aluminum chloride? <b><math>Al_2O_3</math> ,<math>AlCl_3</math> 1,1</b>	Element	Valency	Aluminum	3+	Chlorine	1	Oxygen	2-	5
Element	Valency									
Aluminum	3+									
Chlorine	1									
Oxygen	2-									
36	a) Five or six fish species are cultured together in a single pond. What is this system of fish culture called as? <b>Composite fish culture 1</b> b) How are different species for above type of culture selected? <b>Inhabit different areas of pond, different nutrient requirements 1+1</b>	5								

	c) Mention the problem associated with this system and also explain how this problem can be solved. <b>Mixing of fish seed due to common breeding season 1, hormonal stimulation 1</b>	
	<b>SECTION-E</b>	
37	<p>A body of mass 8 kg is falling from point A and reaches point B via point C.</p>  <p>a) If P.E. at point A is 180 J, find the momentum of the ball at point A. <b>0 (1 mark)</b>  b) If P.E. at point C is 80 J, find the velocity of the ball at point C and its height above the ground. <b>v=25m/s h=1 m (1mark each)</b></p> <p style="text-align: center;"><b>OR</b></p> <p>c) If K.E. at point C is 100 J, find its velocity at point C and its height above the ground. <b>v=25m/s h=1 m (1mark each)</b>  d) State the law which is used in the above situation. <b>Law of conservation of energy. 1 mark</b></p>	4
38	<p>Mixture of two or more substance with one phase only, i.e., having no distinct boundary of constituent particles are called solution. For example, solution of sugar and water, solution of salt and water, lemonade, soft drinks, etc. Solution is a homogeneous mixture of two or more substances. In a solution, components are mixed in such a way that they appear as only one phase. Seeing by naked eye, constituent particles of a solution cannot be identified because particles are mixed evenly throughout.</p> <p>a) A dispersed phase particle in a zig-zag movement is shown. What kind of motion is exhibited by the particle? <b>Brownian motion 1</b></p>  <p>b) Give an example of alloy and its constituents . <b>brass/bronze ½ , Zn Cu ½ / Cu Sn ½</b>  c) Differentiate between a colloid and a suspension.(2 points) <b>any 2 differences 1,1</b></p> <p style="text-align: center;"><b>OR</b></p> <p>c) A solution contains 50 g of common salt in 400 g of water. Calculate the concentration in terms of mass by mass percentage of the solution? <b>Formula 1 mk ,calculatn 50/450 X 100 ½ , 11.1% ½</b></p>	4
39	<p>Read the following paragraph and 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="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p><b>A</b></p> </div> <div style="text-align: center;">  <p><b>B</b></p> </div> <div style="text-align: center;">  <p><b>C</b></p> </div> </div> <p>a) Name the type of epithelial tissue which help in the movement of particles such as mucus out of the respiratory tract and how?  b) How does a multicellular gland formed inside epithelial tissue?  c) Skin is made up of a specialized squamous epithelium. What is this epithelium called as and what is its advantage?</p> <p style="text-align: center;"><b>OR</b></p> <p>c) Which type of epithelium is present in ducts of salivary glands? Write its function.  <b>a) B ciliated columnar epithelium ,traps the dust and mucus .5+.5</b>  <b>b) By getting folded inwards 1 c) stratified squamous epithelium 1, prevents wear and tear 1</b>  <b>OR</b>  <b>c) cuboidal epithelium, provides support 1+1</b></p>	4