



## INDIAN SCHOOL AL WADI AL KABIR

FINAL EXAMINATION (2023-2024)

Sub: Science (086)

SET-1

Date: 20.02.2024

Max. Marks: 80

Class: IX

Time Allowed: 3 hours

### **General Instructions:**

- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. Section A consists of 20 objective type questions carrying 1 mark each.
- iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
- v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should be in the range of 50 to 80 words
- vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
- vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

### **SECTION - A**

**Select and write one most appropriate option out of the four options given for each of the questions 1 – 20.**

Q. No	Questions	Marks
1	In which of the following set up, the rate of diffusion is faster? (a) 5g of Potassium permanganate crystals in 100ml of water at 25 <sup>0</sup> C. (b) 5g of Potassium permanganate crystals in 100ml of water at 0 <sup>0</sup> C. (c) 5g of Potassium permanganate crystals in 100ml of water at 15 <sup>0</sup> C. (d) 5g of Potassium permanganate crystals in 100ml of water at 60 <sup>0</sup> C.	1
2	The chemical formula of Hydrogen chloride is: (a) H <sub>2</sub> Cl (b) HCl (c) HCl <sub>2</sub> (d) HCl <sub>3</sub>	1

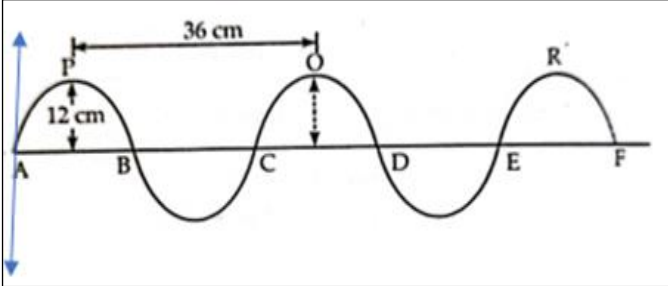
3	<p>Which of the following is incorrect?</p> <p>(a) Solids have fixed shape and fixed volume.            (b) Liquids have fixed volume but not shape.            (c) Gases have neither fixed shape nor volume.            (d) The particles have least intermolecular space but maximum kinetic energy in liquids.</p>	1									
4	<p>The chemical symbol for Sodium is:</p> <p>(a) So            (b) Sd            (c) NA            (d) Na</p>	1									
5	<p>If K and L shells of an atom are full, the total number of electrons in that atom are:</p> <p>(a) 10            (b) 2            (c) 8            (d) 12</p>	1									
6	<p>On converting <math>25^{\circ}\text{C}</math>, <math>38^{\circ}\text{C}</math> and <math>66^{\circ}\text{C}</math> to Kelvin scale, the correct sequence of temperature will be:</p> <p>(a) 298K, 311K and 339K            (b) 298K, 300K and 338K            (c) 273K, 278K and 543K            (d) 298K, 310K and 338K</p>	1									
7	<p>Composition of nuclei of two atomic species X and Y are given:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td></td> <td>X</td> <td>Y</td> </tr> <tr> <td>Protons</td> <td>6</td> <td>7</td> </tr> <tr> <td>Neutrons</td> <td>8</td> <td>7</td> </tr> </tbody> </table> <p>The mass number of X and Y and their relation is:</p> <p>(a) 14,14; isobars            (b) 13, 15; isotopes            (c) 14,14; isotopes            (d) 13, 15; isobars</p>		X	Y	Protons	6	7	Neutrons	8	7	1
	X	Y									
Protons	6	7									
Neutrons	8	7									
8	<p>The image shows a bacterial cell and an animal cell. Based on the structures, a student claims that the animal cell contains complex structures that are absent in the bacterial cell.</p> <p>Which statement can the student make to support the claim?</p>	1									

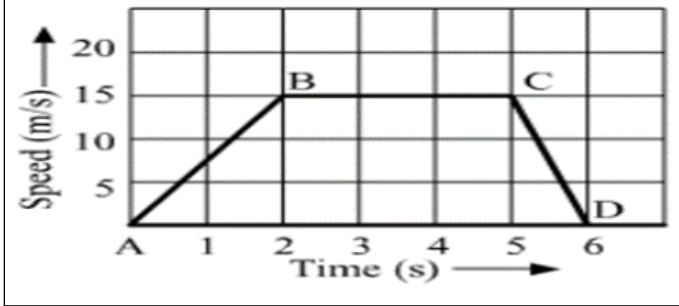
	<div data-bbox="393 201 1193 613" data-label="Image"> </div> <p>(a) Animal cell contains flagella that aids in locomotion that is absent in case of a bacterial cell.</p> <p>(b) Nuclear material of the bacterial cell is not enclosed in a nuclear envelope as in the case of an animal cell.</p> <p>(c) Cytoplasmic content of the bacterial cell is not enclosed in a thick cell wall as in the case of an animal cell.</p> <p>(d) Animal cell contains ribosomes spread across the cell whereas in case of bacterial cell they are clumped together.</p>	
9	<p>Tom has a bacterial infection. Which part of the cell will help him eliminate bacteria from his body and how?</p> <p>(a) Golgi bodies as they can destroy their own cell.</p> <p>(b) Vacuoles as they can uptake any material and store it.</p> <p>(c) Lysosomes as they have digestive enzymes to break down foreign material.</p> <p>(d) Vacuoles as they can expel substance out of the cell.</p>	1
10	<p>While examining a thin slice of cork, Robert Hooke saw that the cork resembled:</p> <p>(a) Structure of a honeycomb</p> <p>(b) Bark of a tree</p> <p>(c) Sea of structures floating</p> <p>(d) Irregularly shaped boxes</p>	1
11	<p>The image shows the location of a connective tissue.</p> <div data-bbox="440 1524 979 1864" data-label="Image"> </div>	1

	<p>What will be the likely function of this connective tissue?</p> <p>(a) Allow bones to move.  (b) Provides strength to the bones.  (c) Prevent the bones from bending.  (d) Connects one bone with the other bones.</p>											
12	<p>The table lists the characteristics of few Milch breeds of cattle.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Milch Breed of Cattles</th> <th>Characteristics</th> </tr> </thead> <tbody> <tr> <td>Jersey</td> <td>Long lactation period</td> </tr> <tr> <td>Sahiwal</td> <td>Resistant to diseases</td> </tr> <tr> <td>Brown Swiss</td> <td>Long lactation period</td> </tr> <tr> <td>Red Sindhi</td> <td>Resistant to diseases</td> </tr> </tbody> </table> <p>Based on the characteristics listed in the table, what will be the characteristics of the new breed if Jersey and Red Sindhi are cross-bred?</p> <p>(a) The new breed will have a long lactation period and will be resistant to diseases.  (b) The new breed will have a small lactation period but will be resistant to diseases.  (c) The new breed will have a long lactation period but will not be resistant to diseases.  (d) The new breed will have a small lactation period and will not be resistant to diseases.</p>	Milch Breed of Cattles	Characteristics	Jersey	Long lactation period	Sahiwal	Resistant to diseases	Brown Swiss	Long lactation period	Red Sindhi	Resistant to diseases	1
Milch Breed of Cattles	Characteristics											
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13	<p>If the mass of the body is doubled and its velocity becomes half, then the linear momentum of the body will:</p> <p>(a) Become double  (b) Remain same  (c) Become half  (d) Become four times</p>	1										
14	<p>If the speed of a car become 2 times, then its kinetic energy becomes:</p> <p>(a) 4 times  (b) 8 times  (c) 2 times  (d) 16 times</p>	1										
15	<p>Which statement correctly defines mixed cropping?</p> <p>(a) Growing two or more crops on the same field.  (b) Growing different varieties of same crop on the same field.  (c) Growing different crops on rotation basis on the same field.  (d) Growing two or more crops on the same field in a definite pattern.</p>	1										

16	<p>Which muscles act involuntarily?</p> <p>(i) Striated muscles (ii) Smooth muscles (iii) Cardiac muscles (iv) Skeletal muscles</p> <p>(a) (i) &amp; (ii) (b) (ii) &amp; (iii) (c) (iii) &amp; (iv) (d) (i) &amp; (iv)</p>	1
<p>Q. no 17 to 20 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>(a) Both A and R are true and R is the correct explanation of A. (b) Both A and R are true and 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>		
17	<p><b>Assertion:</b> Atomicity is the number of atoms present in a molecule. <b>Reason:</b> A molecule is made up of atoms. It exists in nature in free state.</p>	1
18	<p><b>Assertion:</b> The outer membrane of mitochondria is folded into cristae. <b>Reason:</b> Cristae increases the surface area.</p>	1
19	<p><b>Assertion:</b> Weight of a body on earth is equal to the force with which the body is attracted towards the earth. <b>Reason:</b> Weight of a body is independent of the mass of the body.</p>	1
20	<p><b>Assertion:</b> Permanent tissues are derived from meristematic tissue once they lose the ability to divide. <b>Reason:</b> Meristematic tissue is the dividing tissue present in the growing regions of the plant.</p>	1
<p><b>SECTION – B</b> <b>Q. no. 21 to 26 are very short answer questions</b></p>		
21	<p>Name the process associated with each of the following conversions: (i) Solid Ammonium chloride changes to vapour on heating. (ii) Solid wax on heating changes to liquid wax.</p>	2
22	<p>Which organelle is known as the powerhouse of the cell? Why?</p>	2
23	<p>Differentiate between tendon and ligament.</p>	2

24	State the universal law of gravitation. What happens to the force between two objects, if the mass of one object is doubled?	2
25	What are ultrasonic waves? Write any two applications of ultrasonic waves. <b>OR</b> What is an Echo? State two necessary conditions for an echo to be heard.	2
26	What are macronutrients? Give two examples <b>OR</b> What facilities should the shelter of cattle have?	2
<b>SECTION - C</b> <b>Q.no. 27 to 33 are short answer questions.</b>		
27	(i) Give an example each of a diatomic and polyatomic molecule of elements.  (ii) State the law of conservation of mass.  (iii) Write the names of the compounds: (a) $MgCl_2$ (b) $Na_2CO_3$	3
28	(i) Define molecular mass. (ii) Give one example each of cation and anion. (iii) Calculate the molecular mass of the following. (a) $NH_4OH$ and (b) $H_2O$ [Atomic mass of N=14u, H=1u, O=16u]  <b>OR</b>  (i) Write the chemical formulae of the following: (a) Magnesium oxide (b) Calcium hydroxide.  (ii) The atomic number of three elements A, B, and C are 11, 10, and 17 respectively. Which of them will form a cation and which one will form an anion?	3
29	Draw and label the different elements of phloem.	3
30	Name the exotic variety of honey bees. What are the characteristics for which they were introduced in India?	3
31	State Newton's second law of motion. Using second law of motion, derive the relation between force and acceleration.	3

32	<p>(i) Define power.  (ii) Calculate the power of an electric pump that can lift 800 kg of water from the ground into a tank placed at a height of 1500 cm in 20 seconds. (Take <math>g=10 \text{ m/s}^2</math>)</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) What is the work done by the force of gravity on a satellite moving around the earth?  (ii) Calculate the work done by the force when the force is acting on a mass of 20 kg and there is a change in velocity from 5 m/s to 2 m/s.</p>	3
33	<p>(i) Distinguish between transverse waves and longitudinal waves.  (ii) Waves of frequency 200 Hz are produced in a string as shown in the figure. Calculate its:  (a) Amplitude  (b) Wavelength  (c) Velocity</p> <div style="text-align: center;">  </div>	3
<p><b>SECTION - D</b>  <b>Q.no. 34 to 36 are Long answer questions.</b></p>		
34	<p>(i) Explain why particles of a colloidal solution do not settle down when left undisturbed, while in case of a suspension they do.  (ii) What are the two components of a solution? Write two properties of a solution.  (iii) Tyndall effect is not seen in solutions. Explain.</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) Give two reasons to support that air is a mixture, not a compound.  (ii) You are provided with soda water, milk and muddy water. How can you differentiate between them in terms of:  (a) Homogeneity  (b) Filtration  (c) Tyndall effect</p>	5

35	<p>(i) What is a composite fish culture system? Write at least two advantages of this culture system.</p> <p>(ii) What is the drawback of this system and how is it overcome?</p> <p style="text-align: center;"><b>OR</b></p> <p>Briefly comment upon the following: -</p> <p>(i) Organic Farming</p> <p>(ii) Intercropping</p> <p>(iii) Pasturage</p> <p>(iv) Symptoms of sick animals</p> <p>(v) Preventive measures for poultry to protect from diseases.</p>	5
36	<p>(i) Distinguish between speed and velocity. (2 points)</p> <p>(ii) The speed-time graph of a car is given alongside. The car weighs 100 kg.</p> <div style="text-align: center;">  </div> <p>(a) What is the distance travelled by car in the first two seconds?</p> <p>(b) What is the braking force applied at the end of 5 seconds to bring the car to a stop within one second?</p> <p style="text-align: center;"><b>OR</b></p> <p>(i) Define distance and displacement. A body covers one complete revolution around a circular park of circumference 176 m in 4 minutes. Find the displacement of body after 6 minutes?</p> <p>(ii) The brakes applied by a car produces an acceleration of <math>6 \text{ m/s}^2</math> in opposite direction of motion. The car takes 2 seconds to stop after the application of brakes. Calculate the distance it travels during this time.</p>	5
<p><b>SECTION – E</b></p> <p><b>Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.</b></p>		
37	<p>Radioactivity is actually a property of an atom. Radioactive atoms have unstable nuclei, and they will eventually release subatomic particles to become more stable, giving off energy and radiation in the process. Often, elements come in both radioactive and nonradioactive versions that differ in the number</p>	



of neutrons they contain. These different versions of elements are called isotopes, and small quantities of radioactive isotopes often occur in nature. Atoms of each element contain a characteristic number of protons. In fact, the number of protons determines what atom we are looking at (e.g., all atoms with six protons are carbon atoms). In contrast, the number of neutrons for a given element can vary.

Complete the following table and answer the following questions.

2

Element	Atomic number	Mass number	Number of protons	Number of electrons	Number of neutrons
A	6	14	-----	6	8
B	18	-----	18	18	22
C	-----	40	20	20	20
D	6	12	6	6	-----

(i) Define isotopes and isobars.

(ii) Pick up the pair of isotopes and the pair of isobars from the above table.

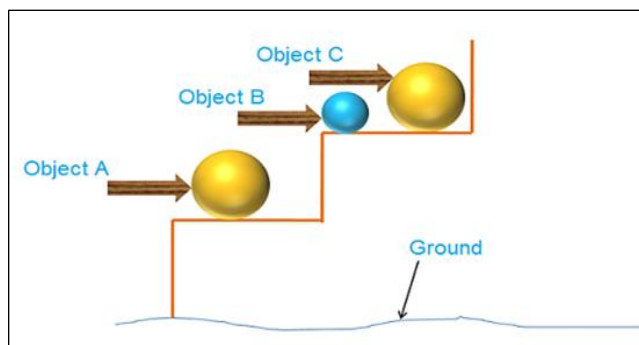
2

**OR**

(ii) Draw the atomic structure of element A.

38

Lift an object through a certain height. The object can now do work. It begins to fall when released. This implies that it has acquired some energy. If raised to a greater height it can do more work and hence possesses more energy. From where did it get the energy? In the above situations, the energy gets stored due to the work done on the object. The energy transferred to an object is stored as potential energy if it is not used to cause a change in the velocity or speed of the object. An object increases its energy when raised through a height. This is because work is done on it against gravity while it is being raised. The energy present in such an object is the gravitational potential energy. The gravitational potential energy of an object at a point above the ground is defined as the work done in raising it from the ground by height  $h$  to that point against gravity.



	(i) What is potential energy?	1
	(ii) Find the energy possessed by an object of mass 10 kg when it is at a height of 6 m above the ground. (Given, $g = 9.8 \text{ m/s}^2$ ).	1
	(iii) Name the transformation of energy involved in the following cases: (a) When a body is thrown upwards. (b) When a body falls from the top of a hill. <b>OR</b>	2
	(iii) The potential energy of a freely falling object decreases progressively. Does this violate the law of conservation of energy? Why?	2
39	Connective tissue is specialised to connect various body parts with each other, for example it connects two or more bones to each other, muscles to bones, binds different tissues together and also gives support to various parts of the body. The cells of connective tissue are loosely packed, living and embedded in an intercellular matrix that may either be jelly-like fluid, dense or rigid in nature. The nature of the matrix differs in concordance with the function of the particular connective tissue. The various types of the connective tissue are blood, bones, ligaments, tendons, cartilage, areolar tissue, adipose tissue.	
	(i) What decides the function of a particular connective tissue?	1
	(ii) What is the function of adipose tissue?	1
	(iii) Why is blood called a connective tissue? Name the cellular components of blood connective tissue? <b>OR</b>	2
	(iii) What is cartilage made up of? Give any two locations of cartilage in the body.	2