

SECOND SEMESTER – MARCH 2025

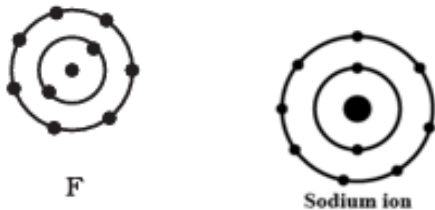
ANSWER KEY

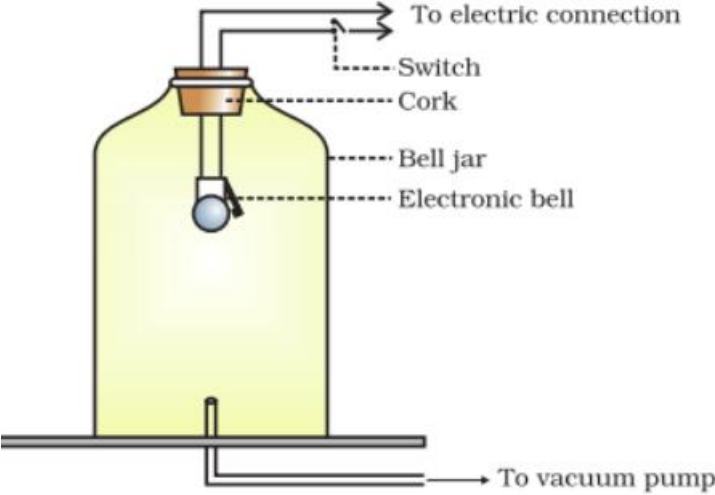
GRADE : 9

SUB : SCIENCE

MAX. MARKS : 70

Sr.no	ANSWERS	SET: A	Marks
1	(C) $\text{Zn}_3(\text{PO}_4)_2$		1
2	(D) ^{138}u		1
3	(B) 2,1,1 and 4		1
4	(B) Constant proportions		1
5	(A) Ammonium sulphate		1
6	(A) 2, 8		1
7	(C) Both 3 and 5		1
8	(C) Isobars		1
9	(A) a and c		1
10	(D) 14: 3		1
11	(B) anion		1
12	(C) K, Ag and Pb		1
13	(B) Protons		1
14	(B) / (D)/two different non-metals or a metal and a non-metal		1
15	(C) cochlea		1
16	(D) Work done		1
17	(B) 18 KWh		1
18.	(C) 16 times		1
19	(C) 3300 J		1
20	(A) Elastic potential energy to Kinetic energy		1
21	(A) 100 ms^{-1}		1
22	(A) 1050 m		1
23	(D) Intensity of sound		1
24	(B) Statements (i) and (ii)		1
25	(A) East to west		1
26	(A) 344 m		1
27	(C) harmful radiations of the sun		1
28	(C) Alkaloids and urea		1
29	(D) The prevailing season in an area		1
30	(C) photosynthesis		1
31.	(A) Breeding of fishes		1
32	(C) lightening		1
33	(A) Nitrates in to nitrogen		1
34	(A) NO_2 and SO_2		1
35	(C) CO_2 in atmosphere $\rightarrow$ organic carbon in plants $\rightarrow$ organic carbon in animals $\rightarrow$ inorganic carbon in soil		1

	PART II		
	SUBJECTIVE		
36	(i) MgSO_3 (ii) $\text{Ca}(\text{HCO}_3)_2$ (iii) $(\text{NH}_4)_2\text{S}$ (iv) HNO_3	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
37	Diagrams 	1	2
38	Molecular mass of $\text{CO}_2 = 12 + 2 \times 16 = 44 \text{ u}$ 1 mole of $\text{CO}_2 = 44 \text{ g}$ 5 moles of $\text{CO}_2 = 5 \times 44 = 220 \text{ g}$ Molecular mass of $\text{H}_2\text{O} = 2 \times 1 + 16 = 18 \text{ u}$ 1 mole of $\text{H}_2\text{O} = 18 \text{ g}$ 5 moles of $\text{H}_2\text{O} = 5 \times 18 = 90 \text{ g}$ Therefore 5 moles of CO_2 and 5 moles of H_2O do not have the same mass	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	2
39	-Chemical properties of the elements depend on the number of electrons since the isotopes of the elements have the same number of electrons they will have the same chemical properties -Physical properties of the elements depend on their atomic mass since the isotope of the elements have different atomic mass their physical properties will be different. <u>-Two medicinal uses of isotopes</u> - An isotope of uranium is used as a fuel in nuclear reactors. - An isotope of cobalt is used in the treatment of cancer. - An isotope of iodine is used in the treatment of goitre. (Accept any two)	1 $\frac{1}{2}$ $\frac{1}{2}$	2
40	-No work is done because there is no displacement of the bundle of hay. The person gets tired due to muscular fatigue. This is because his muscle are stretched and blood is displaced to	$\frac{1}{2}$	

	the strained muscle more rapidly. These changes consume energy and he feels tired. -If one Joule of work is done in one second the power of the agent is said to be one watt.	$\frac{1}{2}$ 1	2
OR			
40	-No energy is transferred in this case The muscles get stretched and blood goes to stretched muscles so feels tired Or it is converted into internal energy in your body and the surroundings. -when a force of one newton displaces an object by one meter then the amount of work done is said to be one joule	$\frac{1}{2}$ $\frac{1}{2}$ 1	2
41	Scientifically correct diagram  Correct labeling	1 $\frac{1}{2}$ $\frac{1}{2}$	2
42	-the frequency of the sound appears to be increasing as the air column of the bucket is getting filled with water. OR the sound becomes sharper and of a higher pitch. -the change in the sound is caused by the decreasing of air column and therefore increasing of frequency	1 1	2
OR			
42	His voice sounded prolonged due to reverberation -In a large empty halls had more reflective surfaces, causing Ramesh's voice to be reflected multiple times (Multiple reflection of sound) and making the sound more prolonged until it is reduced to a value where it is no longer audible.	$\frac{1}{2}$ $\frac{1}{2}$	2

	-Use of ultrasound in : Industries: (Any one) 1. It is used to detect cracks in metal blocks without damaging them. 2. It is used to clean 'hard to reach' parts of machines, spiral tubes, etc. Hospitals: (Any one) 1. Echocardiography – to check & form an image of the heart. 2. Ultrasonography – to check internal organs, to detect kidney stones, also to check the development of the foetus.	1/2	
43.	-lichens grows on the surface of the rocks ,while growing they release some substances ,that cause the rock surfaces to powder and form thin layer of soil -moss and roots of big trees also help in the formation of soil (accept any one) <u>-Any two factors that control movement of wind:</u> - rotation of the earth around its axis , - presence of mountain ranges in the path of the wind, - uneven heating of the atmosphere	1	2
OR			
43	-air is a bad conductor of heat (Any one point) -it keeps average temperature of earth fairly steady during the day and even during the course of the whole year -prevents sudden increase or decrease in temperature (Any one point) -soil erosion can be prevented by planting more vegetation especially more shrubs and grass -adding mulch and rocks -building bunds (OR accept any other correct answer)	1	2
44	-Positive work – pushing a box through a distance -lifting a book through a height -when a door opens by push or a pull -Negative work - work done by force of gravity on an object when object being lifted. (eg. -drawing water from the well using a pulley and a rope. -work done by friction when we walk)	1	2

	(OR accept any other correct answer)						
45	A=17, B= 18, C= 1, D = 6, E= 4 F = 46	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	3				
46	- (i) Atoms of the same element combine together to form a molecule of an element.(for example molecule of an element is made by two hydrogen atoms i.e. H₂) -atoms of different elements combine together in a definite proportion to form a molecule of compound. (for example hydrogen and oxygen combines together in a ratio of 2 : 1 to form H₂O) (ii) (a) 1 atom of He = 4u or 4u of He = 1 atom of He 16 u of He = $\frac{1}{4}$ x16 = 4 atoms of He (b) The number of atoms = given mass /molar mass x Av. Number N = m/M xN₀ = 16 g/4g x 6.022 x 10²³ = 24.088 x 10²³ atoms	$\frac{1}{2}$ $\frac{1}{2}$ 1 $\frac{1}{2}$ $\frac{1}{2}$	3				
OR							
46	(i) <table><tr><td>molecular mass</td><td>Molar mass</td></tr><tr><td>Sum of the atomic mass of the elements in a molecule or compound is called its molecular mass</td><td>Molar mass is gram atomic mass of an atom or gram molecular mass of compound</td></tr></table> (ii) (a)1 mole of iron = 56 g 112 g of iron = ? Number of moles = given mass in grams /molar mass n = m /M = 112g/56 = 2 moles	molecular mass	Molar mass	Sum of the atomic mass of the elements in a molecule or compound is called its molecular mass	Molar mass is gram atomic mass of an atom or gram molecular mass of compound	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	
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	(b) 1 mole of water(H₂O) = gram molecular mass of water = 18 g Thus 18 g of H₂O = 1 mole of H₂O 108 g of H₂O = ? Number of moles = given mass in grams /molar mass n = m/M = 108/18 = 6 moles		3										
47	Correct drawing of the diagram with different stages <i>Fig. 14.8: Oxygen-cycle in nature</i> <table><tr><th>Atmosphere on the earth</th><th>Atmosphere on venus /mars</th></tr><tr><td>contain O₂ and N₂</td><td>N₂ and O₂ are absent</td></tr><tr><td>Carbon dioxide content is very low (0.02%)</td><td>carbon dioxide content is 75 % to 95%</td></tr><tr><td>water vapour present</td><td>water vapour is absent</td></tr><tr><td>temperature is normal</td><td>temperature ranges from - 190 °C to 110 °C</td></tr></table>	Atmosphere on the earth	Atmosphere on venus /mars	contain O ₂ and N ₂	N ₂ and O ₂ are absent	Carbon dioxide content is very low (0.02%)	carbon dioxide content is 75 % to 95%	water vapour present	water vapour is absent	temperature is normal	temperature ranges from - 190 °C to 110 °C	2	3
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	(iii) <table><tr><th>Transverse wave</th><th>Longitudinal wave</th></tr><tr><td>-waves whose individual particle of the medium move about their mean position in a direction perpendicular to the direction of a wave propagation</td><td>-Waves whose individual particle move the medium move in a direction parallel to the direction of propagation of disturbance</td></tr><tr><td>OR Particles of the medium vibrates perpendicular to the direction of the wave propagation</td><td>OR Particles of the medium vibrates parallel to the direction of the wave propagation</td></tr></table>	Transverse wave	Longitudinal wave	-waves whose individual particle of the medium move about their mean position in a direction perpendicular to the direction of a wave propagation	-Waves whose individual particle move the medium move in a direction parallel to the direction of propagation of disturbance	OR Particles of the medium vibrates perpendicular to the direction of the wave propagation	OR Particles of the medium vibrates parallel to the direction of the wave propagation	1	
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49	Solution Mass of the = 1000 Kg Initial velocity = 20 km/h = 5.5 m/s Final velocity = 50 km/h = 13.8 m/s Initial kinetic energy = $\frac{1}{2} mv^2 = \frac{1}{2} \times 1000 \times 5.5 \times 5.5$ = 15125 J Final kinetic energy = $\frac{1}{2} \times 1000 \times 13.8 \times 13.8$ = 95220 J Therefore , work done = change in kinetic energy = Which is Final energy – Initial energy = 95220 - 15125 = 80095 J (80.09 Kjoules)	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$	4						
OR									
49	Solution Mass = 500 g = 0.5 kg Height(h_1) = 10 m g = 10 m/s Height (h_2) = 8 m (i) Initial potential energy of the ball PE = mgh = 0.5 x 10 x 10	$\frac{1}{2}$							

	$= 50 \text{ J}$ (ii) The kinetic energy of the ball just before striking the ground is Equal to initial potential energy of the ball K.E. = initial potential energy of the ball $= 50 \text{ J}$	$\frac{1}{2}$ 1	4
	(iii) Kinetic energy of the ball after striking the ground = potential energy of the ball at the highest point of rebound $= mgh$ $= 0.5 \times 10 \times 8$ $= 40 \text{ J}$	$\frac{1}{2}$ $\frac{1}{2}$	
	iv) loss of kinetic energy on striking the ground is the difference between potential energy $= 50 \text{ J} - 40 \text{ J}$ $= 10 \text{ J}$	$\frac{1}{2}$ $\frac{1}{2}$	

NOTE: Any other scientifically correct answer should be accepted.
