# DAV PUBLIC SCHOOLS, ODISHA

## PERIODIC ASSESSMENT-II ( 2023-24)CLASS: X SUBJECT: SCIENCE

### BLUE PRINT OF QUESTION PAPER (SET-1)

| SL NO. | CHAPTERS / UNITS | MARKS ALLOTTED IN SYLLABUS | 1 MARK (MCQ/A&R) | 2 MARKS (SA-I) | 3 MARKS (SA-II) | 5MARKS (LA) | 4 MARK(CBQ) | TOTAL MARKS | TOTAL NO. OF QUESTIONS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Ch-1: Chemical Reactions& Equations | 7 | 1(2) | 2(1) | 3(1) | -- | -- | 7 | 4 |
| 2 | Ch-2: Acids, Bases & Salts | 12 | 1(3) | -- | -- | 5(1) | 4(1) | 12 | 5 |
| 3 | Ch-3: Metals &Non metals (Up to Page no. 49 excluding occurrence of metals) | 6 | 1(3) | -- | 3(1) | -- | -- | 6 | 4 |
| 4 | Ch-5: Life Processes | 18 | 1(4) | 2(1) | 3(1) | 5(1) | 4(1) | 18 | 8 |
| 5 | Ch-6: Control & Coordination | 12 | 1(5) | 2(2) | 3(1) | -- | -- | 12 | 8 |
| 6 | Ch-9: Light-Reflection & Refraction | 5 | -- | 2(1) | 3(1) | -- | -- | 5 | 2 |
| 7 | Ch-10: The Human Eye & the Colourful World | 8 | 1(1) | -- | 3(1) | -- | 4(1) | 8 | 3 |
| 8 | Ch-11: Electricity | 12 | 1(2) | 2(1) | 3(1) | 5(1) | -- | 12 | 5 |
| | **TOTAL** | 80 | 20 | 12 | 21 | 15 | 12 | 80 | 39 |

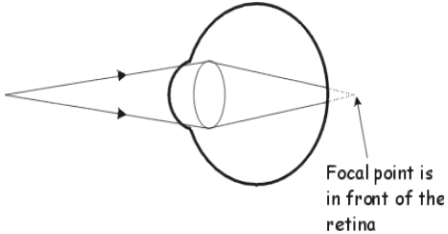| | | | | |
|---|---|---|---|---|
| **DAV PUBLIC SCHOOLS, ODISHA** | | | | |
| **PERIODIC ASSESSMENT-II (2023-24)CLASS:  X   SUBJECT: SCIENCE** | | | | |
| **QUESTIONWISE ANALYSIS**(SET-1) | | | | |
| **Q.No.** | **Chapters / Units** | **Forms of Question (MCQ, AR, SA-I, SA-II, LA, CBQ)** | **Marks Allotted** | **Typology of Questions (Knowledge (K), Understanding (U), Applications (A),Hots(H)&Skills(S)etc.)** |
| 1 | Ch-3: Metals & Non-metals (Up to Page no. 49 excluding occurrence of metals) | MCQ | 1 | A |
| 2 | Ch-2: Acids, Bases and Salts | MCQ | 1 | K |
| 3 | Ch-1: Chemical Reaction & Equation | MCQ | 1 | K |
| 4 | Ch-2: Acids, Bases and Salts | MCQ | 1 | S |
| 5 | Ch-3: Metals & Non-metals (Up to Page no. 49 excluding occurrence of metals) | MCQ | 1 | K |
| 6 | Ch-1: Chemical Reaction & Equation | MCQ | 1 | K |
| 7 | Ch-2: Acids, Bases and Salts | MCQ | 1 | A |
| 8 | Ch-5: Life Processes | MCQ | 1 | K |
| 9 | Ch-6: Control & Coordination | MCQ | 1 | U |
| 10 | Ch-5: Life Processes | MCQ | 1 | S |
| 11 | Ch-6: Control & Coordination | MCQ | 1 | U |
| 12 | Ch-6: Control & Coordination | MCQ | 1 | U |
| 13 | Ch-10: The Human Eye & the Colourful World | MCQ | 1 | K |
| 14 | Ch-11: Electricity | MCQ | 1 | A |
| 15 | Ch-5: Life Processes | MCQ | 1 | A |
| 16 | Ch-6: Control & Coordination | MCQ | 1 | U |
| 17 | Ch-3: Metals & Non-metals (Up to Page no. 49 excluding occurrence of metals) | AR | 1 | U |
| 18 | Ch-5: Life Processes | AR | 1 | U |
| 19 | Ch-11: Electricity | AR | 1 | U |
| 20 | Ch-6: Control & Coordination | AR | 1 | U |
| 21 | Ch-1: Chemical Reaction & Equation | SA-I | 2 | K |
| 22 | Ch-5: Life processes | SA-I | 2 | U |
| 23 | Ch-6: Control & Coordination | SA-I | 2 | U |
| 24 | Ch-9: Light-Reflection & Refraction | SA-I | 2 | A |
| 25 | Ch-11: Electricity | SA-I | 2 | A |
| 26 | Ch-6: Control & Coordination | SA-1 | 2 | K |
| 27 | Ch-3: Metals & Non-metals (Up to Page no. 49 excluding occurrence of metals) | SA-II | 3 | U |
| 28 | Ch-1: Chemical Reaction & Equation | SA-II | 3 | S(1), K(1),U(1) |
| 29 | Ch-6: Control & Coordination | SA-II | 3 | U |
| 30 | Ch-5: Life processes | SA-II | 3 | H |
| 31 | Ch-10: The Human Eye & the Colourful World | SA-II | 3 | S |
| 32 | Ch-9: Light-Reflection & Refraction | SA-II | 3 | H |
| 33 | Ch-11: Electricity | SA-II | 3 | U |
| 34 | Ch-2: Acids, Bases and Salts | LA | 5 | H |

| 35 | Ch-5: Life Processes | LA | 5 | S(2),A(1),K(2) |
|---|---|---|---|---|
| 36 | Ch-11: Electricity | LA | 5 | A |
| 37 | Ch-2: Acids, Bases and Salts | CBQ | 4(1+1+2) | K(2), A(2) |
| 38 | Ch-5: Life Processes | CBQ | 4(1+1+2) | A(2), K(2) |
| 39 | Ch-10: The Human Eye & the Colourful World | CBQ | 4(1+1+2) | H |

# DAV PUBLIC SCHOOLS, ODISHA

## PERIODIC ASSESSMENT-II(2023-24)CLASS: X SUBJECT: SCIENCE

# MARKING SCHEME (SET – 1)

## TIME ALLOWED: 3 HOURS MAX. MARKS: 80

| Q. NO. | VALUE POINTS | MARKS ALLOTTED | PAGE NO. OF TEXT BOOK |
|---|---|---|---|
| 1 | (a) High melting point | 1 | Pg. 49 |
| 2 | (c ) Baking soda | 1 | Pg. 31 |
| 3 | (c) (i) and (ii) | 1 | Pg. 6 |
| 4 | (d) Caustic soda | 1 | Pg. 22 |
| 5 | (d)dil.$HNO_3$ | 1 | Pg. 42 |
| 6 | (c) CaO | 1 | Pg. 8 |
| 7 | (d) (ii) and (iv) | 1 | Pg. 23 |
| 8 | (c) (i),(ii) and (iii) | 1 | Pg. 95 |
| 9 | (d) Receptors →sensory neuron→ spinal cord →motor neuron→ muscles | 1 | Pg. 103 |
| 10 | (c). I-Nucleus, II-Stomatal pore, III-Epidermal cell, IV-Guard cell | 1 | Pg 83 |
| 11 | (b) Auxin - Wilting of leaves | 1 | Pg. 108 |
| 12 | (d) C only | 1 | Pg.107 |
| 13 | (c)Remain unchanged | 1 | Pg .162 |
| 14 | (c)R3> R2> R1 | 1 | Pg.176 |

| | | | |
|---|---|---|---|
| 15 | (b)Tracheids transport water and minerals & sieve tubes transport food | 1 | Pg. 94 &95 |
| 16 | (c) | 1 | Pg. 101 |
| 17 | (c) Assertion is true but the Reason is false. | 1 | Pg.45 |
| 18 | (b)Both A and R are true. Ris not the correct explanation of A. | 1 | Pg.82 |
| 19 | (d)Assertion (A) is false but reason(R) is true. | 1 | Pg. 180 |
| 20 | (c) Assertion is true but the Reason is false. | 1 | Pg. 110 |
| 21 | Hydrogen gas. Because the water molecule contains two hydrogens and one oxygen in its molecular formula. Therefore, after electrolysis of water volume of hydrogen gas collected is double of the oxygen gas.<br><br>$2H_2O \rightarrow 2H_2 + O_2$ | 1<br><br>1 | Pg.9 |
| 22 | a) Because the amount of dissolved oxygen in water is fairly low as compared to the amount of oxygen in the air.<br>b) Because haemoglobin has a very high affinity for oxygen & carbon dioxide is more soluble in water than oxygen. | 1<br>1 | Pg. 89<br><br>Pg. 90 |
| 23 | Auxin<br>Tendrils are sensitive to touch. When they come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This causes the tendril circle around the object.<br><div align="center">OR</div><br>Feedback mechanism<br>If the sugar level in blood rises, they are detected by the cells of pancreas. Pancreas produce more insulin to reduce the sugar level. When the blood sugar level falls, insulin secretion is reduced. | ½<br><br>1 ½<br><br><br>OR<br>½<br>1 ½ | Pg. 106<br><br><br><br><br>Pg. 111 |
| 24 | Here  u = - 10cm  and   m = -3<br>But   m= - v/u   or v =-mu  = -(- 3 )x (-10) =-30cm<br><br><div align="center">OR</div><br>f =20 cm, v = 40 cm, u=?<br> Using the lens formula  1/v - 1/u  = 1/f<br>-1/u = 1/f - 1/v =  1/20 – 1/40 =-1/u =1/40  or u =-40cm<br>m = h₂/h₁ =v/u  = 40/ -40 =  -1<br>Image is real and  inverted and of same size is that of object. | 2 | Pg. 145 , 155 |
| 25 | Here,   H  = 400 J , t = 4s , R = 4Ω<br>Using  H =( V²/R ) X t<br> V = (HR/t)^{1/2}=[(400 x 4)/4] ^{1/2} = 20 volt<br><div align="center">or</div><br>Any other correct method will be  awarded. | 2 | Pg. 189 |
| 26 | Adrenaline<br>  i.    Heart beat faster to supply more oxygen to our muscles.<br>  ii.    Blood to the digestive system and skin is reduced and diverted to skeletal muscles<br>  iii.    Breathing rate decreases due to contraction of diaphragm | ½<br>½<br>½<br>½ | Pg.109 |

| | | | |
|---|---|---|---|
| | and rib muscles. | | |
| 27 | Sodium reacts both with air and water. It is therefore kept in kerosene oil in order to avoid contact with both air and water.<br><br>Platinum, Gold and silver are placed at the bottom of the activity series and are very little reactive in nature and are known as noble metals. They are not even affected by air, water and even by chemicals. Since they have bright lusture, we can use them for making jewellery.<br><br>Metal : Mercury<br>Non metal: Bromine | 1<br><br><br><br>1<br><br><br>1 | Pg.38-40 |
| 28 | a. Redox / oxidation / combination  Reaction<br><br>b. $2 Cu + O_2 \rightarrow 2 CuO$<br><br>c. If hydrogen gas is passed over this heated material ($CuO$) the black coating of the surface turns brown and copper is obtained.<br>$CuO + H_2 \rightarrow Cu + H_2O$<br><br>OR<br>(i) any one chemical reaction<br>(ii) any one chemical reaction<br>(iii) any one chemical reaction | 1<br><br>1<br><br><br>1<br><br><br>OR<br>1<br>1<br>1 | Pg. 12<br><br><br><br>Pg. 3<br><br>Chap -1 |
| 29 | 1-Cerebrum, 3- Cerebellum<br>Cerebrum- It is the part of fore brain. It is the largest part of brain. It is the main thinking part of the brain.<br>Cerebellum- It is the part of hind brain. It is the 2nd largest part of brain. It is responsible for voluntary actions and maintains posture & balance of the body.(any 2 points) | 1<br><br><br><br>2 | Pg.104 |
| 30 | (a) A- Sucrose, B- Starch<br>(b) To prevent water loss<br>   Desert plants take up carbon dioxide at night & prepare an intermediate which is acted upon by the energy absorbed by the chlorophyll during the day time. | 1<br>1<br><br><br><br>1 | Pg. 81,96,82 |
| 31 | a.  (i)The increase in focal length of eye lens<br>     (ii) The  size of the eye ball too small<br>b.  (i). Hypermetropic eye<br><br><br>Focal point is in front of the retina<br><br>ii. correction of hypermetropic eye with suitable optical device | 1+2 | Pg. 163 |

Correction of hypermetropic eye

| | | | |
|---|---|---|---|
| 32 | i. $L_1$ and $L_2$ are convex lens and $L_3$ is concave lens<br>ii. Focal length of $L_1$ ,f1 = 100/10 =10cm<br>Focal length of $L_2$ ,f2 = 100/5 =20 cm<br>Focal length of $L_3$ ,f3 = 100/-10 = -10 cm<br>iii. The image of an object at 15 cm from lens $L_2$ will be virtual and magnified | <br>1<br>1<br><br><br>1 | Pg. 155 |
| 33 | i. When resistors are connected in series ,a net resistance $R_s$ = 12+12 =24 Ω<br>Power consumed , $P_1$ = V $^2$/$R_s$ =36/24 = 1.5 W<br>ii. Resistors are connected in parallel $R_p$ = 12x12/24= 6Ω<br>Power consumed $P_2$ = $V^2$ /R = 36/ 6 = 6W<br>$P_1$ /$P_2$ = 1.5/6 = ¼<br><div align=center>Or</div>50 Ω and 30 Ω are in parallel , their effective resistance = 150/8 Ω<br>20 Ω , 150/8 Ω and 20 Ω are in series , so net effective resistance (Reff.) becomes 470/8 = 58.75 Ω<br>Current drawn = I = $\dfrac{V}{R}$ = 10/ 58.75 =0.170 Amp | <br><br>1<br>1<br>1<br><br><br><br><br><br>1<br>1<br>1 | Pg 191<br><br><br><br><br><br><br>Pg. 186 |
| 34 | X is sodium hydroxide, NaOH.<br><br>When sodium chloride solution (brine solution) is electrolysed, sodium hydroxide solution is formed. $H_2$ and $Cl_2$ gases are liberated. This is chlor-alkali process.<br><br>NaCl + $H_2$ O →(Electrolysis) → NaOH + $H_2$ + $Cl_2$<br>The reaction is neutralization reaction.<br><br>NaOH + HCl→ NaCl + $H_2$ O<br>(ii)It is because process is highly exothermic. If water is added to acid, bottle of acid will break.<br><br><div align=center>OR</div><br>X = $MgCO_3$<br>Gas evolved is = $CO_2$<br>$MgCO_3$ + $H_2SO_4$ → $MgSO_4$ + $CO_2$ + $H_2$ O<br><br>(b) (i) $NaHCO_3$ is antacid. It neutralizes excess of acid formed in the stomach.<br>(ii) The soil is acidic in nature. The farmer wants to make it neutral by adding quicklime. | 1<br><br><br><br>1<br><br><br><br>1<br><br><br>1<br>1<br><br><br><br>1<br><br><br><br><br><br>1<br>1 | Pg.30<br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br>Pg.20 |

| | | | |
|---|---|---|---|
| | | 1 | Pg.27 |
| | | 1 | |
| | | 1 | |
| 35 | (a) i. Lipase- E, Substrate- Emulsified fats<br>    ii. Salivary amylase- A, Substrate- Starch<br> (b) Bile juice<br>   It emulsifies fats, provide alkaline medium for pancreatic enzymes to act (any one)<br> (c) i. In stomach, pepsin secreted by gastric glands breaks down proteins in acidic medium.<br>   ii. In small intestine, trypsin secreted by pancreas digests proteins in alkaline medium.<br><br>OR<br>(a) 1---Pulmonary artery 2—Vena cava<br>(b) Ventricles have thicker elastic wall than atria because they have to pump blood in to various organs whereas atria pump blood to ventricles only.<br>(c) Birds & mammals<br>Such separation allows a highly efficient supply of oxygen to the body to provide more energy to maintain constant body temperature. | 2<br><br>1<br><br>2<br><br>OR<br>2<br><br>1<br><br>2 | Pg. 85,86<br><br><br><br><br><br><br><br><br>Pg. 93<br><br><br>Pg. 94 |
| 36 | <br><br>Total   V = 2 volt x 4 = 8 V<br>Total resistance in the circuit R= $R_1$ +$R_2$ +$R_3$<br>=2 Ω +4Ω +6Ω = 12 Ω<br>According to Ohm's law<br> V=IR<br> I =V/R = 8/12= 0.67 A<br>Current , I = 0.67 ampere flows in circuit<br>Potential difference across 6 Ω ,V =IR =2/3 X 6= 4V<br>OR<br>Electrical energy consumed by refrigerator in one day<br> = power x time = 40 W x 10 h =4000Wh = 4Kwh<br>Energy consumed by 2 electric fans in one day =2 x 80 W x 12 h<br>=1920 Wh<br> = 1920 /1000<br> = 1.92 KWh<br>Energy by 6 electric bulbs in one day =6 x 18 W x 6h<br>=(648/1000)KWh= 0.648 KWh<br>Total electrical energy consumed in one day<br>= 4 units +1.92 units +0.648 units<br>= 6.568 units | 2<br><br><br>2<br><br><br><br>1<br><br><br>OR<br>1<br><br><br>1<br><br>1<br>2 | Pg -175<br><br><br><br>Pg -191 |

| | Total electrical energy consumed in the month of June (30 days)<br>= 6.568 x 30 = 197.04 units<br>Total cost = 197.04 x 3 =Rs. 591. 12 | | |
|---|---|---|---|
| 37 | a. Calcium sulphate hemi hydrate,<br>Formula: $CaSO_4.\frac{1}{2}H_2O$<br>b. One water molecule is shared by two formula units of $CaSO_4$.<br>So half molecule of water of crystallization is present in plaster of paris.<br>c. Plaster of paris is prepared by **heating gypsum (CaSO4.2H₂O) at 393K**<br><br>$$CaSO_4 \cdot 2H_2O \xrightarrow[393K]{heat} CaSO_4 \cdot 1/2\ H_2O + 3/2\ H_2O$$<br>Gypsum $\quad\quad$ calcium sulphate<br>$\quad\quad\quad\quad\quad$ hemihydrate<br><br>The difference of water molecules in gypsum and plaster of Paris is = 3/2<br><center>OR</center><br>White Colour. Setting into hard mass when come in contact with water which is called gypsum.<br>CaSO4. ½ H₂O + 3/2H₂O → CaSO4. 2H₂O | 1<br><br>1<br><br><br><br>1<br><br><br><br>1<br><br><br><br>1<br><br><br>1 | Pg.32-33 |
| 38 | a. The natural kidneys are able to reabsorb water and reduce the amount of initial filtrate, but in Hemodialysis no reabsorption takes place.<br>b. 180L, due to selective reabsorption by the tubular parts of nephron.<br>c. Glucose, amino acid, salts and water (any other constituent)<br><center>OR</center><br>i. Amount of excess water present in the body.<br>ii. Amount of dissolved waste is to be excreted. | 1<br>1<br>2<br><br>OR<br>2 | Pg. 97 |
| 39 | a. Violet<br>b. The speed of light depends upon the wavelength of colors of light. Each colour of light travels with different speed in given medium due to different wavelength<br>c. The refraction of light taking place in atmosphere is known as atmospheric refraction, Phenomenon associated with is twinkling of star (any correct answer)<br><center>OR</center><br>i) Angle of incidence (ii) Lateral shift or lateral displacement | 1+1+2 | Pg 167,168 |