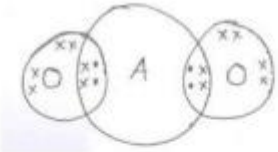
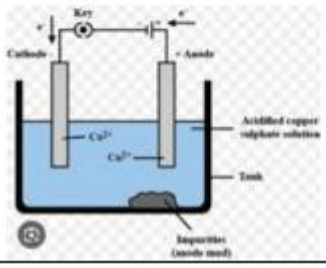
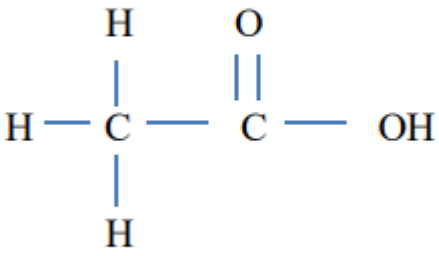
THE VILLAGE INTERNATIONAL SCHOOL THODUPUZHA
SECOND MODEL EXAMINATION (2023-24)
Science (Subject Code – 086)
Marking Scheme

Class X **Time: 3 hours**
08-01-2024 **Max.Marks: 80**

		1
1	d) green to yellow	**1**
2	d) 4	**1**
3	d) $NaHCO_3$	**1**
4	a) The litmus paper used is dry	**1**
5	d) i and iv	**1**
6	d) 19	**1**
7	c) Z is a non metal	**1**
8	b) Bile pigments	**1**
9	d) receptors sensory neuron → spinal cord → motor neuron → muscles.	**1**
10	b) stem, roots and leaves	**1**
11	b) thyroxine	**1**
12	b) alveoli of lungs.	**1**
13	a) concave lens	**1**
14	a) Red colour is least scattered	**1**
15	a) chloroflurocarbon compounds	**1**
16	option (C) correct	**1**
17	b) Both A and R are true but R is not the correct explanation of A.	**1**
18	option (A) correct	**1**
19	option (C) correct	**1**
20	A is true but R is false	**1**
21	Metal A: Aluminum B : Aluminum Oxide (Al_2O_3) $Al_2O_3 + 6\ HCL \longrightarrow 2AlCl_3 + 3H_2O$ $Al_2O_3 + 2NaOH \longrightarrow 2NaAlO_2 + H_2O$	**2**
22	embroyo developed from the synergid – haploid embryo developed from the nucellus – diploid	**2**
23	The stamen and pistil are the reproductive parts of an angiosperm. They are located in the flower. Stamen is the male reproductive part of a flower. A stamen consist of anther and filament. i) anther: anther is a saclike structure that produces pollen grain ii) filament : filament is a thin stalk – like structure that sulphate anther. OR i) valves ensure that blood does not flow backward when the atria or ventricles contract	**2**

24	Refractive index of glass with respect to $H_2O = \frac{1.5}{1.33} = \underline{\underline{1.127}}$ Refractive index of water with respect to glass $= \frac{1.33}{1.5} = \underline{\underline{0.89}}$	**2**
25	Equivalent resistance is given by $1/R_1 = 5/R + 5/R + 5/R + 5/R + 5/R$ $= 25/R$ $R/R_1 = 25$ Or a. The magnetic field pattern indicates the strength and directions of a magnetic field. The field is strong in places where the number of field lines per unit area is high. The field is lower in strength where the number of magnetic b. The reversal of a magnetic field change the directions of the magnetic field.	**2**
26	As per 10% law of flow of energy in an ecosystem only 10% of energy is received by the next trophic level. Hence, in the given food chain: if 100J of energy available to lion, the plants or producers have 10,000 J of energy available to them. Plants ⟶ Deer ⟶ Lion 10,000 1000 100	**2**
27	a. Al is more active metal but it gets oxidized and forms a thin protective layer of aluminum oxide which prevents further corrosion. b. Nitric acid is a strong oxidizing agent. The hydrogen gas produced during its reaction with metals get oxidized to water, hence no hydrogen is produced. c. Aluminium has greater affinity for oxygen than carbon .Therefore carbon cannot reduce aluminium oxide to aluminium.	**3**
28	Element A is a non metal.  Or X Cu Y CuO 	**3**

29	a) mucus protects the inner lining of the stomach from the action of the acid under normal conditions. b) the exit of food from the stomach is regulated by sphincter muscles which release it in small amounts into small intestine. c) from stomach, food enters into small intestine.	**3**
30	Sperm formation requires a lower temperature than the normal body temperature. This temperature is 1- 3^0c lower than the temperature of the body. Testes are thus located outside so that scrotum provides an optimal temperature for the formation of the sperm. a) Endocrine function – production of male hormone (testosterone) b) exocrine function – production of male gametes (sperms)	**3**
31	The two positions are when the object is placed between 1. The pole and the focus 2. The focus and the center of curvature Difference between the two images 1. In case (i), the image is formed behind the mirror 2. In case (i), the image is formed is virtual and erect. 1. In case (ii), the image is formed beyond the center of curvature 2. In case (ii), the image formed is and inverted.	**3**
32	P1 = 1000W = 1kW t1 = 5h No.of days in September = 30 E1 = P1 x t1 x n 1 kW x 5h x 30 150kWh P2 = 400 W = 0.4 kW t2 = 10 h E2 = 0.4 kW x 10 h x 30 = 120kWh Total energy = 150 kWh + 120kWh = 270kWh Total cost = 270 x 6 = Rs. 1620	**3**

33	The situation in which live and neutral wire come in direct contact abruptly increasing the current in the circuit is called short circuit. Factor :- Insulation of wire is damaged/ fault in the appliance. Safety device – Electric fuse An electric fuse is an apply of Joule's heating. If there is a current larger than the specified value to break the electric circuit and stop the flow of unduly high electric current.	**3**
34	a. Y = ethyl ethanoate Z = Con. H_2SO_4 b.  c. Esterification Or i. C_2H_4 (A) decolorizes the bromine water therefore it contains = bond. Hence (A) is ethylene ii. $CH_2 = CH_2 + Cl_2 \rightarrow$ CH2(Cl) — CH2(Cl) 1,2, dichloroethane iii. CH2 = CH2 + HBr ⟶ CH2 — CH2 — Br (A) Ethylene (C) Ethyl Bromile	**5**

35	Differentiate between asexual and sexual reproduction is as follows. Asexual reproduction — sexual reproduction 1. In this type of reproduction only A single parent is involved. — 1. In this type of reproduction two Parents are involved. 2. Off springs has exactly similar features with the parent. — 2. Certain features both the parents resemble the child 3. Cell division occurs mitotically — 3. Cell division involves both mitosis and meiosis 4. Gametes are not produced in this type Of reproduction. — 4. Gametes are produced in sexual Reproduction 5. Fertilization does not take place — 5. Fertilization of gametes takes place. 6. Genetic variations does not occur. — 6. Genetic variation occurs. or a. i) enzyme trypsin – this enzyme is produced by the pancreas in an inactive from called trypsinogen. Trypsin converts remaining proteins into peptones and peptones into peptides and aminoacids ii. enzyme lipase – it is secreted by pancreas and small intestine. Lipase converts fats into fatty acid and glycerol. iii..Two function of villi are:- 1.The villi greatly increase the absorption is surface area of the inner lining of smallintestine. 2. The large surface area of small intestine of helps in rapid absorption of digestedfood b .Touch – me-not plants responds to touching by folding to leaflets and this types of movement is called growth independent movement . ie the movements of plants do not result in their growth.	**5**

36	u = 75 cm f = +10cm 1/v – 1/u = 1/f 1/v = 1/f + 1/u = 1/10 + 1/-15 =1/30 v = +30 cm magnification = v/u = 30/-15 = -2 Nature of the image Real, inverted, magnified size of the image (h_1) m= hi/ho, hi = m x ho -2 X 200 =-400 cm= -4 m	**5**
37	1. Alkaline K permanganate/ acidified K dichromate 2. $CH_3CH_2CH_2OH$ + Alk. KM_2O_4 ⟶ CH_3Ch_2COOH 3. Because they can add oxygen to the reactant molecule very early and convert them to acid. 4. Good solvent, used to make syrups and drinks	**4**
38	i) In the F1generation, dwarf trait is recessive trait which was not expressed. After self pollination the recessive trait gets expressed in F2 generation. ii) ratio – 3:1 full form of DNA – Deoxyribonucleic acid or i) all plants of F1 generation will be tall plants ii) variations promote the survival only when the species wants to allow by itself, For survive to the continous changing environment and conditions. During variations, different species get different kinds of advantages depending on the nature.	**4**
39	a) 1/R = ½ +1/6 + 1/8 = 19/24 R = 24/19 b) Resistivity will remain same.	**4**

c)

Between the points A and B : Three resistance 2Ω, 2Ω, 2Ω are in series.

The equivalent resistance $R' = 2 + 2 + 2 = 6\Omega$.

This is joined in parallel with a resistance 2Ω.

The equivalent resistance $R = \frac{2 \times 6}{2 + 6} = \frac{12}{8}$

$= 1.5\Omega$.

d)

Equiavalent resistance between point A and B, through C is

$R_{ACB} = 7 + 3 = 10\Omega$

Equivalent resistance between point A and B is $R_{AB} = (\frac{1}{10} + \frac{1}{10})$

or, $R_{AB} = 5\Omega$

Equiavalent circuit resistance between X and $Y = (7 + 5 + 3)\Omega = 15\Omega$

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