

केंद्रीय विद्यालय संगठन, अहमदाबाद संभाग
KENDRIYA VIDYALAYA SANGATHAN, AHMEDABAD REGION

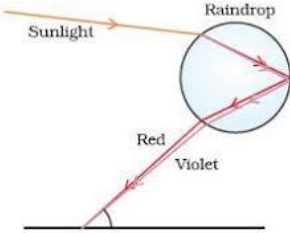
प्री-बोर्ड परीक्षा 2022-23
PRE-BOARD EXAMINATION 2022-23

SUBJECT: SCIENCE
CLASS: X

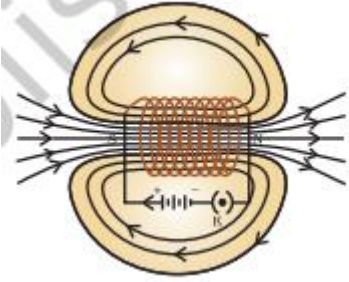
M M: 80
TIME: 3 Hours


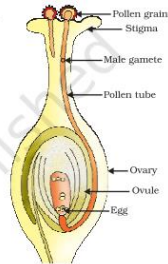
MARKING SCHEME

Q.NO	QUESTIONS	MARKS
1.	(a) (i) and (ii)	1
2.	(a) Yes, as a new substance was formed in the form of a gas.	1
3.	(c) (ii) only	1
4.	(d) weak acid and strong base	1
5.	(a) Hydrogen	1
6.	(a) Water < Acetic acid < Hydrochloric acid	1
7.	(c) (ii) and (iv)	1
8.	(a) increase in the absorption of food	1
9.	(c) It stores the urine till urination.	1
10.	(a) round and yellow	1
11.	(b) Phototropism	1
12.	(c) plumule, cotyledon and radicle	1
13.	(b) They are inversely proportional to each other.	1
14.	(c) R	1
15.	(d) nature of the material	1
16.	(c) same at all points	1
17.	(d) A is False but R is true	1
18.	(a) Both A and R are true and R is the correct explanation of A	1

19.	(a) Both A and R are true and R is the correct explanation of A	1
20.	(c) A is true but R is false	1
21.	X = Calcium oxide (Quick lime), Y= calcium hydroxide (Ca(OH) ₂). Combination reaction. $2\text{CaO} + 2\text{H}_2\text{O} \rightarrow 2\text{Ca(OH)}_2$ OR Reactions in which one reactant gets oxidised while the other gets reduced during the reaction, are called oxidation-reduction reactions or redox reactions. substance oxidized- Al substance reduced- MnO ₂	2
22.	(a) Auxins Growing tips of the plant (b) More auxin is produced on the shaded side than on the parts towards the light,so the shaded parts grows faster and plant bend towards light.	1 1
23.	(A) sensory neuron (B) Motor neuron (C) effector (muscle) (D) spinal cord Heat (stimulus) -----> receptor (skin) -----> spinal cord----->effector (organ) -----> response.	1/2*4
24.	(a) ventricles have thicker muscular walls than atria because they have to pump blood into various organs. (b) transport system in plants is slow because: (i) plants have low energy needs. (ii) plant bodies have a large proportion of dead cells in many tissues.	1 2
25.	A rainbow is a natural spectrum appearing in the sky after a rain shower It is caused by dispersion of sunlight by tiny water droplets, present in the atmosphere. A rainbow is always formed in a direction opposite to that of the Sun. The water droplets act like small prisms. They refract and disperse the incident sunlight, then reflect it internally, and finally refract it again when it comes out of the raindrop. Due to the dispersion of light and internal reflection, different colours reach the observer's eye.	1 1
		
26.	(a) insect :second trophic level (primary consumer) Owl Fourth trophic level (tertiary consumer) (b) insect :2000 J Owl:20 J: 20 J	1 2

	Due to 10% law of energy flow.	
27.	(a) X: Sodium sulphate (Na_2SO_4) and Y: Barium sulphate (BaSO_4) (b) Double displacement reaction. (c) $\text{Zn(s)} + \text{CuSO}_4(\text{aq}) \rightarrow \text{ZnSO}_4(\text{aq}) + \text{Cu(s)}$ $\text{Pb(s)} + \text{CuCl}_2(\text{aq}) \rightarrow \text{PbCl}_2(\text{aq}) + \text{Cu(s)}$ Or any other	1 1 1
28.	(a) decreasing order of reactivity: $\text{Mg} > \text{Al} > \text{Zn} > \text{Fe} > \text{Cu}$ (b) What would you observe when you put: (i) Some zinc pieces into blue copper sulphate solution. Zn being more reactive displaces copper from copper sulphate solution and blue colour of the solution fades as zinc sulphate is colourless. (ii) No change in green colour as copper being less reactive can not displace iron from its salt solution.	1 1 1
29.	(i) The mucus protects the inner lining of the stomach from the action of the acid under normal conditions (ii) The exit of food from the stomach is regulated by a sphincter muscle which releases it in small amounts into the small intestine. (iii) From the stomach, the food enters the small intestine. OR (a) Arteries : Arteries are the vessels which carry blood away from the heart to various organs of the body (b) Lymph : Lymph carries digested and absorbed fat from intestine and drains excess fluid from extra cellular space back into the blood. (c) platelets: platelet cells circulate around the body and plug the leaks by helping to clot the blood at the points of injury.	1 1 1
30.	The degree of convergence or divergence of light rays achieved by a lens is expressed in terms of its power. The power of a lens is defined as the reciprocal of its focal length. It is represented by the letter P . The power P of a lens of focal length f is given by $P = 1/f$ The SI unit of power of a lens is 'diopetre'. It is denoted by the letter D. $f = 40 \text{ cm} = 40/100\text{m}$ $P = 1/f = 1 \times 100/40$ $= +2.5 \text{ D, convex lens}$ $f = -20 \text{ cm.} = -20/100\text{m}$ $P = 1 \times 100/-20$ $= -5\text{D (concave lens)}$	1 1 1
31.	$m = -v/u$ $-2 = -(-30)/u$ $u = 30/-2$ $u = -15\text{cm}$ $1/f = 1/v + 1/u = 1/-30 + 1/-15$ $= (1+2)/-30 = 3/-30 = -10 \text{ cm}$ If object is moved 10 cm towards the mirror image will be virtual and erect and behind the mirror.	1 1 1

32.	<p>(a) A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called a solenoid.</p>  <p>(b). Right hand thumb rule: Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field</p>	1 1 1
33.	<p>Ozone (O₃) is a molecule formed by three atoms of oxygen. Ozone, is a deadly poison.</p> <p>Ozone at the higher levels of the atmosphere is a product of UV radiation acting on oxygen (O₂) molecule. The higher energy UV radiations split apart some molecular oxygen (O₂) into free oxygen (O) atoms. These atoms then combine with the molecular oxygen to form ozone as shown</p> $O_2 \xrightarrow{UV} O + O$ $O + O_2 \xrightarrow{UV} O_3$ <p>Ozone performs an essential function. It shields the surface of the earth from ultraviolet (UV) radiation from the Sun. This radiation is highly damaging to organisms, for example, it is known to cause skin cancer in human beings.</p>	1 1 1
34.	<p>(a) CH₃COOH</p> <p>(b) Ethanoic acid reacts with absolute ethanol in the presence of an acid catalyst to give an ester</p> $CH_3 - COOH + CH_3 - CH_2OH \xrightarrow{\text{Acid}} CH_3 - \underset{\text{O}}{\underset{ }{C}} - O - CH_2 - CH_3 + H_2O$ <p>(Ethanoic acid) (Ethanol) (Ester)</p> <p>(c)</p> $CH_4 + Cl_2 \xrightarrow{\text{sunlight}} CH_3Cl + HCl$ $CH_3CH_2OH + O_2 \rightarrow CO_2 + H_2O + \text{heat and light}$ <p style="text-align: center;">OR</p> <p>(a) carbon compounds which contain only carbon and hydrogen are called hydrocarbons.</p> <p>(b) C_nH_{2n+2} C_nH_{2n} C_nH_{2n-2}</p> <p>Correct electron dot structure of methane, ethene and ethyne.</p> <p>(c) Addition Reaction</p>	1 2 2 1 3 1

		
35.	<p>(a)(i) Ovary (production of egg) (ii) Oviduct (site of fertilisation) (iii) Uterus (site of implantation) (iv) Vagina (entry of the sperms)</p> <p>(b) In reproduction, DNA passes from one generation to the next. Copying of a DNA takes place with consistency but with minor variations. This consistency leads to stability of species.</p> <p>(c) Mechanical barriers like condom prevents the sperms from reaching the egg. Thus it is an effective method to avoid pregnancy. It also prevents transmission of infections during sexual act.</p> <p style="text-align: center;">OR</p> <p>The process or mechanism of transfer of pollen grains from the anther to the stigma is termed pollination. The fusion of male and female gaemtes giving rise to zygote is termed fertilisation The site of fertilisation is ovule. The product of fertilisation is zygote.</p> 	<p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p> <p>3</p>
36.	<p>(a) $R_1=R_2=R_3=R_4=4\ \Omega$ $1/R' = 1/R_3 + 1/R_4 = 1/4 + 1/4 = 2/4$ $R' = 2\ \Omega$ $R_1 + R_2 + R' = 4\ \Omega + 4\ \Omega + 2\ \Omega = 10\ \Omega$</p> <p>(b) Joule's heating effect, $H = I^2 R t$.</p> <p>(c) $P = 2000\text{w}$ $V = 220\text{V}$ $I = P/V = 2000/220 = 9.09\ \text{A}$. We need 10 A fuse for an air conditioner which consumes 2 kW power at 220 V power source because if it is less than 9.09 A then appliance will not work as fuse will melt and if it is more than 10 A then it will not melt at that current and it will not protect the appliance.</p> <p>(d) both draw different current so not practical to connect different appliances of different powers in series as different appliance draw different current at the same voltage source.</p>	<p>1</p> <p>1</p> <p>2</p> <p>1</p>
37.	<p>(i) A solution of the metal salt is used as an electrolyte: Acidified copper sulphate .</p> <p>(ii) the insoluble impurities settle down at the bottom of the anode and are known as anode mud.</p>	<p>1</p> <p>1</p>

	<p>(iii) Many metals, such as copper, zinc, tin, nickel, silver, gold, etc., are refined electrolytically. In this process, the impure metal is made the anode and a thin strip of pure metal is made the cathode.</p> <p style="text-align: center;">OR</p> <p>On passing the current through the electrolyte, the pure metal from the anode dissolves into the electrolyte. An equivalent amount of pure metal from the electrolyte is deposited on the cathode.</p> <p style="text-align: center;">a. $\text{Cu} \longrightarrow \text{Cu}^{2+} + 2\text{e}^{-}$</p> <p style="text-align: center;">b. $\text{Cu}^{2+} + 2\text{e}^{-} \longrightarrow \text{Cu}$</p>	2
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38.	<p>i. Plants with round and yellow coloured seeds. ii. YYRR and yyrr iii. Plant with wrinkled and green coloured seeds (S) (genotype rryy) is crossed with plant with wrinkled and yellow coloured seeds (R) (genotype rrYY or rrYr). If plant with wrinkled and green coloured seeds (rryy) is crossed with plant having wrinkled and yellow coloured seeds of genotype rrYY then all plants produced with wrinkled and yellow coloured seeds whereas if plant with wrinkled and green coloured seeds (rryy) is crossed with plant having wrinkled and yellow coloured seeds that has genotype rrYy then 50% plants with wrinkled and yellow coloured seeds and 50% plants with wrinkled and green coloured seeds are produced.</p> <p style="text-align: center;">OR</p> <p style="text-align: center;">9 : 3 : 3 : 1 ratio of phenotypes only</p> <p style="text-align: center;">Correct cross.</p>	1 1 2 2
39.	<p>(i) Medium b is denser . light bend towards normal when it enters from rarer medium to denser medium.</p> <p>(ii) The absolute refractive index of the medium is the ratio of speed of light in vaccum/air to the speed of light in that medium.</p> <p>(iii) Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The speed of light in vacuum is 3×10^8 m/s</p> <p style="text-align: center;">$n = C/V_g$</p> <p style="text-align: center;">$1.50 = 3 \times 10^8 / V_g$</p> <p style="text-align: center;">$V_g = 3 \times 10^8 / 1.5$</p> <p style="text-align: center;">$= 2 \times 10^8 \text{m/s}$</p> <p style="text-align: center;">OR</p> <p>$n_d = V_g / V_d = 1.6,$ $n_g = C / V_g$ and $n_d = C / V_d$ $V_g / V_d \times C / V_g = n_d$ $= 1.6 \times 1.5 = 2.40$</p>	1 1 2 2
