



COMMON PRE-BOARD EXAMINATION 2022-23



Subject: SCIENCE (086) Marking Scheme

Class: X

Time: 3 Hours

Date:

Max. Marks: 80

General Instructions:

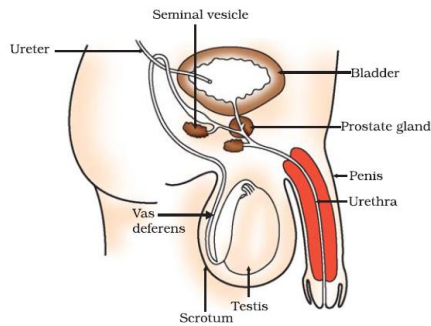
- This question paper consists of 39 questions in 5 sections.
- All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- Section A consists of 20 objective type questions carrying 1 mark each.
- Section B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

SECTION A		
1.	(c) KOH (aq)	1
2.	(b) (ii) only	1
3.	(c) Butanol	1
4.	(a) (i) and (ii)	1
5.	(a) Conc. HCl: Conc. HNO ₃ = 3 :1	1
6.	(b) (i) - (c), (ii) - (d), (iii) - (b), (iv) - (e)	1
7.	(c) 5% - 8% acetic acid in water	1
8.	(c) water in guard cells	1
9.	(a) carbon dioxide	1
10.	(b) (i) and (iv)	1
11.	(d) his sugar level in blood was high	1
12.	(b) halving of chromosomes during gamete formation	1
13.	(a) Same potential difference across them when connected in parallel.	1
14.	(c) Vertically downwards	1
15.	(c) 2A	1
16.	(c) current flows from A to B	1
17.	(a) Both A and R are true and R is the correct explanation of A.	1
18.	(a) Both A and R are true and R is the correct explanation of A.	1
19.	(c) A is true but R is false.	1
20.	(c) A is true but R is false.	1
SECTION-B		
21.	(a) (i) the colour of ferrous sulphate crystals changes from green to white then turn into brown due to formation of Fe ₂ O ₃ . (ii) the smell of burning Sulphur due to the evolution of SO ₂ gas is	2

	<p>observed. (any one observation ½ mark)</p> <p>(b) Thermal decomposition reaction (½ Mark)</p> <p>(c) $2\text{FeSO}_4(\text{s}) - \text{Fe}_2\text{O}_3(\text{s}) + \text{SO}_2(\text{g}) + \text{SO}_3(\text{g})$ (1 Mark)</p> <p>OR</p> <p>(i) The substance getting oxidised is H_2. (½ Mark)</p> <p>(ii) The substance getting reduced is CuO. (½ Mark)</p> <p>(iii) CuO is the oxidising agent. (½ Mark)</p> <p>(iv) H_2 is the oxidising agent. (½ Mark)</p> <p>Since oxidation and reduction is taking place simultaneously, this reaction is an example of redox reaction.</p>	
22	<p>The alveoli provide large surface area for exchange of gases.</p> <p>The wall of the alveoli is very thin and delicate to facilitate easy diffusion of gases.</p> <p>The alveoli are richly supplied with blood vessels for efficient gas exchange.</p> <p>(any two points) (2 x 1)</p>	2
23	<p>Platelets circulate around the body in the blood vessels. Whenever there is an injury, platelets plug the leaks in the blood vessels by forming blood clots at the point of injury.</p> <p>If the bleeding is not minimized there will be a drop in blood pressure. This would reduce the efficiency of the pumping system and may cause death of the individual. (2 x 1)</p>	2
24	<p>Growth hormone is secreted by the pituitary gland. (1)</p> <p>Growth hormone regulates growth and development of the body. Excess growth hormone in childhood leads to gigantism. Deficiency of this hormone leads to dwarfism. (1)</p>	2
25	<p>(i) Different colours of white light bend through different angles with respect to the incident ray as they pass through the prism. The red light bends the least while the violet bends the most(½). The speed of red light is higher than violet light (½).So the red light undergoes least deviation and violet light the most.</p> <p>(ii) The wavelength of the red colour is more when compared to other colours (½).So it is least scattered by fog or smoke while passing through the atmosphere, therefore it travels large distances and reaches our eyes(½).</p> <p>OR</p> <p>In a glass slab, both the refracting faces are parallel(½). Dispersion produced by one face is cancelled by the other face and hence no spectrum is produced(½). In prism, the two refracting faces are not parallel to each other(½) and hence, dispersion produced at the two faces gets added up producing a spectrum(½).</p>	2
26	<p>Frogs consume the larvae of mosquito and keep the mosquito population under control.</p> <p>In the absence of frog, survival of mosquito larvae will increase, giving rise to large number of mosquitoes which cause increased incidence of malaria.</p> <p>Phytoplankton → Zooplankton → Larva of Mosquito → Frog</p> <p>2x1=2</p>	2

SECTION-C		
27	<p>Slaked lime [(Ca(OH)₂] is used for whitewashing. It is obtained when quicklime, CaO reacts with water</p> <p>'A' is CaO and 'B' is Ca(OH)₂. 'C' is CaCO₃ (1 ½)</p> <p>CaO + H₂O → Ca(OH)₂ + heat (½)</p> <p>Ca(OH)₂(aq) + CO₂(g) → CaCO₃(s) + H₂O(l) (1)</p>	3
28	<p>a. Baking soda because it is a milk base (1)</p> <p>X will turn blue litmus to red because it is acidic in nature having pH value less than 7 (1 mark). Y will turn phenolphthalein from colourless to pink because it is basic in nature having pH value greater than 7. (1 mark)</p>	3
29	<p>Nephrons</p> <p>(a) The basic structural and functional units of kidneys which filter the waste from blood and produce urine are called nephrons.</p> <p>(b) Urea is the main nitrogenous waste. It is excreted out in the form of urine.</p> <p>(c) Glucose, amino acids, salts and a major amount of water are selectively re-absorbed as the urine flows along the tube.</p> <p style="text-align: center;">3x1=3</p> <p>OR</p> <p>Transport of oxygen and carbon dioxide</p> <p>(a) Blood contains respiratory pigment haemoglobin which has high affinity for oxygen. (2)</p> <p>Oxygen binds with haemoglobin and is then carried to various body parts through blood circulation. In the tissue region oxygen diffuses from blood to the tissue. Carbon dioxide is more soluble in water than oxygen is and hence is mostly transported in the dissolved form in our blood.</p> <p>(b) The normal systolic pressure is about 120 mm of Hg and diastolic pressure is 80 mm of Hg. (1)</p>	3
30	<p>Height of object, h = 3cm</p> <p>Focal length, f = -20cm (concave mirror)</p> <p>Object distance, u = -10cm</p> <p>Position of image = ?</p> <p>Mirror formula $1/v + 1/u = 1/f$</p> <p>$1/v = 1/f - 1/u$</p> <p>v = 20cm</p> <p>Position of image: 20 cm behind the mirror(right side) (1)</p> <p>Magnification $m = -v/u = h'/h$</p> <p>$h' = -v \times h/u = -20 \times 3 / -10 = 6\text{cm}$</p> <p>Size of the image = 6cm, its magnified. (1)</p> <p>Magnification $m = h'/h = 6/3 = 2$</p> <p>Nature of image : Virtual and erect (1)</p>	3
31	<p>If a person is suffering from both myopia and hypermetropia.</p> <p>(i) Bifocal lenses can correct this defect. (1)</p> <p>(ii) These lenses are prepared by combining both the lenses in spectacles, such that its upper part of the spectacles consists of a concave lens (to correct myopia)(1) and the lower part consists of a convex lens (to correct hypermetropia) (1)</p>	3

32	<p>Any two points. (2)</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Direct current (Battery output)</td> <td style="width: 50%;">Alternating current (Generator output)</td> </tr> <tr> <td>Its magnitude is constant</td> <td>Its magnitude changes with time</td> </tr> <tr> <td>It flows only in one direction</td> <td>Its direction reverses periodically</td> </tr> <tr> <td>Its frequency is zero</td> <td>In India its frequency is 50 Hz</td> </tr> </table> <p>Sources : Dynamo, Battery, Cell, DC Generator Sources : AC Generator, Power stations</p> <p>A.C. is preferred over D.C. because it can be transmitted over long distance without much loss of energy.(1)</p> <p style="text-align: center;">OR</p> <p>(i) When direction of magnetic field is reversed without changing the direction of current, the direction of force also gets reversed. (1)</p> <p>(ii) When direction of current is reversed without changing the direction of magnetic field, the direction of force also gets reversed. (1)</p> <p>(iii) When direction of both the current and magnetic field is reversed, the direction of force remains unchanged. (1)</p>	Direct current (Battery output)	Alternating current (Generator output)	Its magnitude is constant	Its magnitude changes with time	It flows only in one direction	Its direction reverses periodically	Its frequency is zero	In India its frequency is 50 Hz	3
Direct current (Battery output)	Alternating current (Generator output)									
Its magnitude is constant	Its magnitude changes with time									
It flows only in one direction	Its direction reverses periodically									
Its frequency is zero	In India its frequency is 50 Hz									
33	<p>(a) The harmful chemicals enter the food chain in the following way. Terrestrial plants the harmful chemicals along with water and minerals from the soil. Aquatic plants and animals absorb from the water bodies.</p> <p>(b) As these chemicals are not degradable, these get accumulated progressively at each trophic level.</p> <p>(c) Peacock will have maximum concentration of harmful chemicals.</p> <p>Grass → Grasshopper → Frog → Peacock 3x1=3</p>	3								
SECTION-D										
34	<p>Hydrocarbons are the compounds of hydrogen and carbon. (½)</p> <p>General formula for homologues series of:</p> <p>Alkanes -C_nH_{2n+2}</p> <p>Alkenes -C_nH_{2n}</p> <p>Alkynes -C_nH_{2n-2} (1 ½)</p> <p>For drawing the structure of Methane, Ethene and Ethyne (1 ½ marks)</p> <p>Addition reaction (½ mark)</p> <p>CH₂ = CH₂ + H₂ → (Ni catalyst) CH₃ – CH₃ (1 mark)</p> <p>OR</p> <p>The chemical name of the compound is ethanol (½) Its chemical formula is CH₃CH₂OH (½) . any two uses: (1 mark)</p> <p>(a) It is used in medicines as a solvent.</p> <p>(b) It is used in paints, vanishes, etc.</p> <p>(i) The product formed is sodium ethanoate (½ Mark) and hydrogen gas. 2CH₃CH₂OH + 2Na → 2CH₃CH₂ONa + H₂ (1 mark)</p> <p>(ii) The product formed when ethanol with sulphuric acid is ethene (½ Mark) CH₃CH₂OH (in the presence of H₂SO₄ 443 K) → CH₂=CH₂ + H₂O (1 mark)</p>	5								
35	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(a) Diagram of male reproductive system</td> <td style="width: 50%;">2 Marks</td> </tr> <tr> <td style="text-align: center;">Labelling</td> <td style="text-align: center;">1 mark</td> </tr> </table>	(a) Diagram of male reproductive system	2 Marks	Labelling	1 mark	5				
(a) Diagram of male reproductive system	2 Marks									
Labelling	1 mark									



(b) **Vas deferens** is a long muscular tube starting from epididymis and joins with urethra coming from the urinary bladder.

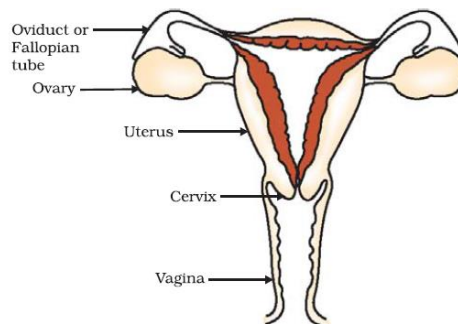
Function: The sperms are delivered through the vas deferens. 1

(c) The secretions from seminal vesicles and prostate glands provide a fluid medium for easy transport of sperms and also provide nutrition to the sperm in the form of fructose, calcium. 1

OR

(a) Diagram of female reproductive system 2 Marks

Labelling 1 mark



(b-i) Condoms prevent the entry of sperm into the vaginal tract of female.

(b-ii) Oral Pills prevent the release of eggs from ovary by changing the hormonal balance of the body.

(b-iii) Implants prevent the implantation of embryo in the uterus.

(b-iv) Vasectomy prevents the release of sperm from testes. $4 \times \frac{1}{2} = 2$

36	<p>(a) Resistance of a conductor depends on: Length of the conductor ($R \propto l$) ($\frac{1}{2}$) Area of cross – section(or thickness) of the conductor. ($R \propto 1/A$) ($\frac{1}{2}$) Nature of material of the conductor ($\frac{1}{2}$) Temperature ($\frac{1}{2}$)</p> <p>(b) Alloys are used for making electrical heating devices because their resistivity is higher than that of constituent metals ($\frac{1}{2}$). They have high melting point so do not oxidise (burn) at high temperatures ($\frac{1}{2}$). Its resistance does not vary much with temperature.</p> <p>(c) $P = 40 \text{ W}$</p>	5
----	---	---

$$V = 220 \text{ V}$$

$$I = P / V = 40 / 220 = 2 / 11$$

$$= 0.18 \text{ A} \quad (1)$$

$$\text{Resistance, } R = V^2 / P = (220 \times 220) / 40$$

$$= 1210 \Omega \quad (1)$$

SECTION-E

- 37 (i) The carbonates ores are changed into oxides by heating strongly in limited air. This process is known as Calcination.
- (ii) $2\text{Zn(s)} + 3\text{O}_2\text{(g)} + \text{heat} \rightarrow 2\text{ZnO(s)} + 2\text{SO}_2\text{(g)}$
- (iii) The metal oxides are reduced to corresponding metal by simply using suitable reducing agents such as coke(carbon).
- OR**
- iii) Reaction which high heat energy evolved are called thermit reaction.
- $$\text{Fe}_2\text{O}_3\text{(s)} + 2\text{Al(s)} \rightarrow \text{Fe (l)} + 2\text{Al}_2\text{O}_3\text{(s)} + \text{heat}$$

38 Making cross 2 marks 4

PINK FLOWER	PINK FLOWER		
		P	P
	P	<u>Pp</u>	<u>Pp</u>
	P	<u>Pp</u>	<u>Pp</u>

PINK FLOWER	PINK FLOWER		
		P	p
	P	PP	<u>Pp</u>
	p	<u>Pp</u>	<u>pp</u>

F1 All flowers are Pink

F2 (3 Pink 1 White) (Genotypic Ratio 1:2:1)

- (i) Trait appeared in F1 is Pink 1/2
Mark
- (ii) Genotype of F1 **Pp** 1/2 Mark
- (iii) F₂ Phenotypic ratio **3: 1**, Genotypic ratio **1:2:1** 1 Mark

OR

(iii) Cross which involves a single pair of contrasting character is called monohybrid cross.

- 39 (a) The radius of curvature = 30 cm
- (b) The image is virtual, erect and magnified.
- (c) Concave mirrors (1) are used in head- lights to get powerful beam of light. This is because when a lighted bulb is placed at the focus of a concave reflector, it produces a powerful beam of parallel light rays. (1)
- OR**
- (c) $m = -v / u = - 30 / - 60$ (1/2)
- $m = 1/2$, (1/2)
- Image is virtual ,erect and smaller than the object. (1)
