COIMBATORE SAHODAYA SCHOOLS COMPLEX

CBESSC Pre Board Examination 2024-2025

SCIENCE (086)

SET A - Scoring KEY

Class: X Time: 3 Hrs

Name: _____ Max. Marks: 100

General Instructions:

Read the following instructions carefully and strictly follow them:

(i) This question paper consists of 39 questions. All questions are compulsory.

(ii) Question paper is divided into FIVE sections viz. Section A, B, C, D and E.

(iii) In Section A question number 1 to 20 are Multiple Choice Questions (MCQs) carrying 1 mark each.

(iv) In Section B question number 21 to 26 are Very Short Answer (VSA) type questions carrying 2 marks each. Answer to these questions should be in the range of 30 to 50 words.

(v) In Section C question number 27 to 33 are Short Answer (SA) type questions carrying 3 marks each. Answer to these questions should be in the range of 50 to 80 words.

(vi) In Section D question number 34 to 36 are Long Answer (LA) type - questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.

(vii) In Section E question number 37 to 39 are of 3 source-based/case-based units of assessment carrying 4 marks each with sub-parts.

(viii) There is no overall choice. However, an internal choice has been provided in some Sections

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Section – A

Select and write the most appropriate option out of the four options given for each of the questions 1 – 20. There is no negative mark for incorrect response.

Q.NO		MARKS
1.	D. MnO_2 is reduced and HCl is oxidised.	1
2.	C. zinc is more reactive than tin.	1
3.	C. (i) and (ii)	1
4.	D. (ii) and (iv)	1
5.	C. Dissolution of ammonium chloride in water	1
6.	D. 11 (2,8,1)	1
7.	B. Barium sulphate	1
8.	A. KOH.	1
9.	C. They make a large surface for absorption	1
10.	B. mitochondria.	1
11.	D. synapse.	1
12.	B. 1:1.	1
13.	D. zero	1
14.	C. Colour used to paint the danger signals	1
15.	C. frog.	1
16.	A. 6000 kJ.	1
17.	B. Both A and R are true, and R is not 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
Question No. 21 to 26 are very short answer questions.

21. (2)

Combination reaction (0.5)
Calcium oxide combines with water to form calcium hydroxide. Hence, it is a combination reaction. (0.5)
$CaO + H_2O \rightarrow Ca(OH)_2$ (1)

22. (2)

A. The transport of soluble products of photosynthesis is called translocation (1)
B. Vascular tissue - Phloem (1)

23. (2)

Attempt either option A or B.
A. (0.5 x 4 = 2)

S.No	Feature	Alveoli	Nephron
1	Structure and location	A balloon like structures present at the terminal ends of bronchioles in lungs.	A tubular structure present in kidneys.
2	Function	Helps in exchange of gases	Helps in filtration of waste in blood and forms urine.

OR

B. Anaerobic respiration in yeast cells produces ethanol and carbon dioxide along with energy. (1)
Anaerobic respiration in human produces lactic acid along with energy. (1)

24. (2)

Law statement (1)
sin i / sin r = a constant (0.5)
n = c/v (0.5)

25. (2)

$R_1 = 10\ \Omega$, $R_2 = 10\ \Omega$, $R_3 = 10\ \Omega$, $R_4 = 20\ \Omega$, $R_5 = 20\ \Omega$

R_2 and R_3 are in series ——$Rs = 20\ \Omega$ (0.5)

Rs and R_4 are in parallel —— $1/Rp = 1/Rs + 1/R_4$ (0.5)

$Rp = 10\ \Omega$ (0.5)

$R1 + Rp + R_5 = 10\ \Omega + 10\ \Omega + 20\ \Omega = 40\ \Omega$ (0.5)

OR

(a) Resistance of a conductor depends on
(i) it's length
(ii) it's cross sectional area
(iii) nature of the material
(iv) temperature—— (any 3 factors) (3x0.5)
(b) SI unit of resistivity —- ohm. metre (Ωm) (0.5)

26. (2)

A. Biological magnification is the process by which a substance, such as a pesticide or a heavy metal, increases in concentration as it moves up in the food chain. (1)
B. Maximum energy - Plants, Maximum pesticides - Human. (0.5 + 0.5)

Section – C
Question No. 27 to 33 are short answer questions.

27. (3)

Cinnabar, sulphide ore (0.5 + 0.5)
(Each equation carry one mark with the condition)

$$2HgS + 3O_2 \xrightarrow{Heat} 2HgO + 2SO_2$$

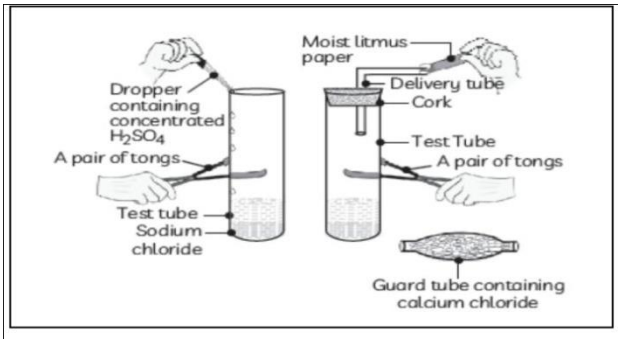
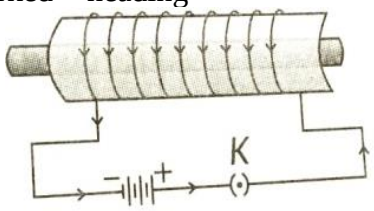
(1)

$$2HgO \xrightarrow{Heat} 2Hg + O_2$$

(1)

28. (3)

(i) B, (0.5)
soil B is acidic in nature, chalk powder is basic. (0.5)

	(ii) Methanoic acid or formic acid, (0.5) use of any mild base (0.5) (iii) Living organisms can survive only in a pH range 7 to 7.8. (0.5) When the pH of river water goes below 5.6 (due to acid rain or pollutants), the survival of aquatic life becomes difficult. (0.5) **OR**  (i) Diagram (1) (ii) the wet litmus paper show a change in colour (1) (iii) HCl solution - hydrogen ions in HCl are produced in the presence of water. (1)	
29.	Amoeba takes in food using temporary finger- like extensions of the cell surface, which fuse over the food particle forming a food vacuole. (1) Inside the food vacuole, complex substances are broken down into simpler ones which then diffuses into the cytoplasm. (1) The remaining undigested material will move to the surface of the cell and thrown out. (1)	3
30.	(i)The colour of all the flowers in F1 generation will be blue. (1) (ii) Percentage of white flower plants in F2 generation will be 25% (1) (iii) The ratio of genotypes BB and Bb in F2 progeny will be 1:2. (1)	3
31.	(a) Myopia or near- sighted ness (0.5) (b) concave lens with suitable power (0.5) (c) causes for myopia: (i) excessive curvature of eye lens (ii) elongation of eye ball (0.5+0.5) (d) Power of this lens P= (1/f) D (0.5) P= 1/-2.5 = - 0.4 D (0.5)	3
32.	For series, Rs = R + 2R =3R (0.5) $P_1 = V^2/ 3R$ (0.5) For parallel , Rp = 2R /3. (0.5) $P_2 = V^2/ (2R/3) = 3V^2/ 2R$ (0.5) Ratio : $P_1/P_2 = (V^2/ 3R) \times (2R / 3V^2)$ (0.5) $P_1/P_2 = 2/9$. (0.5)	3
33.	(a) by increasing number of turns in the coil, by increasing amount of current flowing , by inserting soft iron core. (0.5+0.5+0.5) (b) Diagram- with core marked + heading (1.5)  	3

Section – D

Question No. 34 to 36 are long answer questions.

34. 5

(a) (i) A = ethanol / C_2H_5OH (0.5)

B = ethene / C_2H_4 (0.5)

C = ethane / C_2H_6 (0.5)

$C_2H_5OH \xrightarrow[443K]{H_2SO_4} C_2H_4 + H_2O$

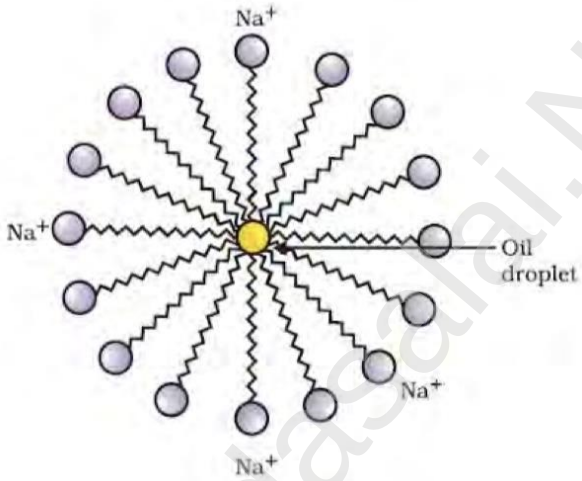
(ii) conversion of A into B (1)

(iii) When ethane undergoes combustion, carbon dioxide is produced along with water and heat. (or) $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$ + Heat (1)

(iv) In industry, hydrogenation reaction is used for preparing vegetable ghee from vegetable oils. (0.5)

(v) Sodium ethoxide and Hydrogen (1)

OR



(b) (i) Michelle formation (2)

(ii) (1) Test tube Y (0.5)

Detergents are effective in hard water. (1)

(2) Test tube X (0.5)

Reaction between soap and calcium and magnesium salts of hard water form insoluble scum/ due to the formation of scum/insoluble precipitate. (1)

35. 5

Attempt either option A or B.

(i) (a) Ovary - It produces the female gamete called ova and secretes the female sex hormones. (1)

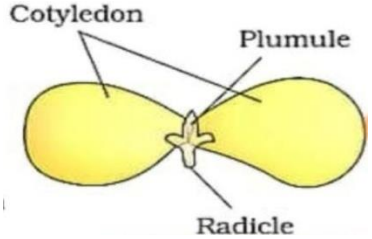
(b) Oviduct - It receives the ova from the ovary and aid in fertilisation. (1)

(c) Uterus - Implantation of the embryo occurs in the lining of uterus and the complete development of foetus occurs here. (1)

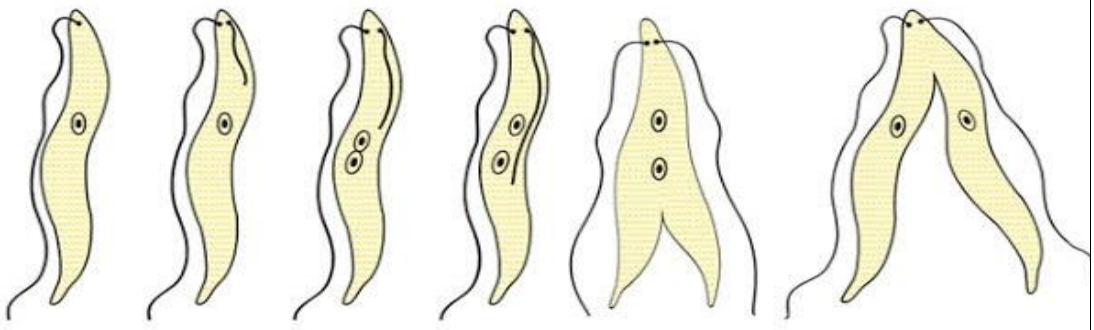
(ii) The developing embryo gets nourishment from the mother's blood with the help of special tissue called placenta (1)

The placenta provides a large surface area for the passage of glucose and oxygen from the mother's blood to the embryo. (1)

OR



B.

	(a) cotyledons (1) (b) radicle (1) (c) Plumule (1) (ii) Leishmania (1)  Diagram (1)	
36.	(a) Ra = 5Ω + 15Ω + 20Ω = 40 Ω (0.5) (b) Rb = 30 Ω (0.5) Rc = 60 Ω (0.5) 1/ Rp = 1/Ra + 1/ Rb (0.5) Rp = 60/3 = 20 Ω (0.5) (c) Rs = Ra + Rp Rs = 40 Ω + 20 Ω = 60 Ω (0.5) V= 6 V I = V / R (0.5) I = 6V / 60 Ω I = 0.1 A (0.5) (d) two relevant disadvantages (0.5 + 0.5) **OR** (a) circuit diagram with 3 resistors in parallel and ammeter and voltmeter connected appropriately in the circuit (1) Explanation of the activity showing $I = I_1 + I_2 + I_3$; V remains same. Deriving at the relation- $1/Rp = 1/R_1 + 1/R_2 + 1/R_3$ (2) (b) $1/Rp = 1/R_1 + 1/R_2$ (0.5) $Rp = 12/2 = 6\ \Omega$ (0.5) I =V / R (0.5) I = 6 V / 6 Ω = 1 A (0.5)	5
	SECTION – E **Question No. 37 to 39 are case-based/data -based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.**	
37.	(a) Plaster of Paris, gypsum (0.5+0.5) (b) $CaSO_4$. ½ H_2O, (0.5) $CaSO_4$. $2H_2O$ (0.5) (c) (i) $CaSO_4 . 2H_2O \xrightarrow{100°C} CaSO_4 . \frac{1}{2} H_2O + 1\frac{1}{2} H_2O$ Gypsum Plaster of Paris (1) (ii) This is because the presence of moisture can cause the slow setting of POP into hard mass by bringing out its hydration. (1) **OR**	4

	(c) The number of water molecules present in one formula unit of a compound. (1) $CuSO_4.5H_2O$ and $Na_2CO_3.10H_2O$ or any other (1)	
38.	(a) (c) - Motor neuron. (d) - Effector muscle. (0.5 + 0.5) (b) The plants use electrical - chemical means to convey the information from cell to cell. (1) (c) A reflex action is an sudden involuntary movement that occurs without conscious thought, whereas a reflex arc is the neural pathway that controls a reflex action. (2) **OR** (c) (a) Sensory neuron. (1) It carries the message from the receptors to the spinal cord or brain. (1)	4
39.	(a) Convex lenses (1) (b) Power, P = 1/F P1/P2 = 4/1 Therefore F1/F2 = 1/4. (1) (c) optical centre (0.5) Diagram of a lens with optical centre marked on it (0.5) A ray passing through optical centre is perpendicular to the curved surface. So, the angle of incidence is 0 and hence angle of refraction is also zero -means the ray does not undergo any deviation. (1) OR Ray diagram to show the image formation by a convex lens when object is between F_1 and O. (1) (reduce ½ mark for not drawing arrow marks) Image characteristics (1)	4

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