COMMON PRE-BOARD EXAMINATION 2022-23

Subject: (Science -086)

Date: Time Allowed: 3hours

Class: X Max. Marks: 80

General Instructions:

i. This question paper consists of 39 questions in 5 sections.

ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

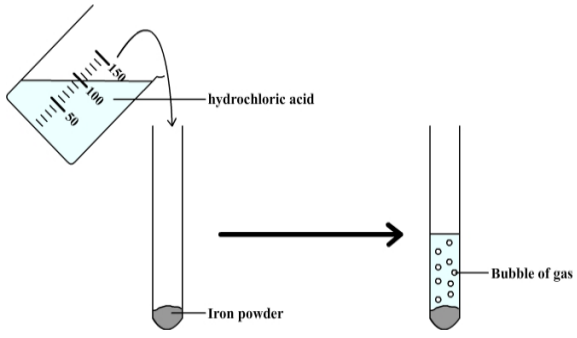
*iii. **Section A** consists of 20 objective type questions carrying 1 mark each.*

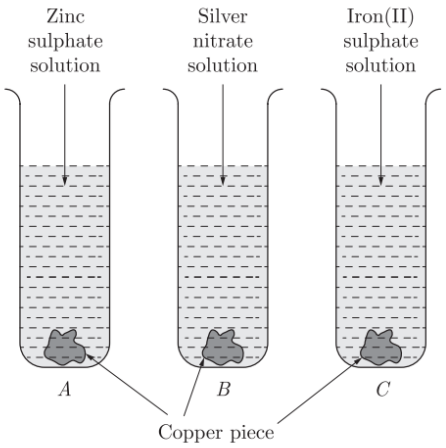
*iv. **Section B** consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.*

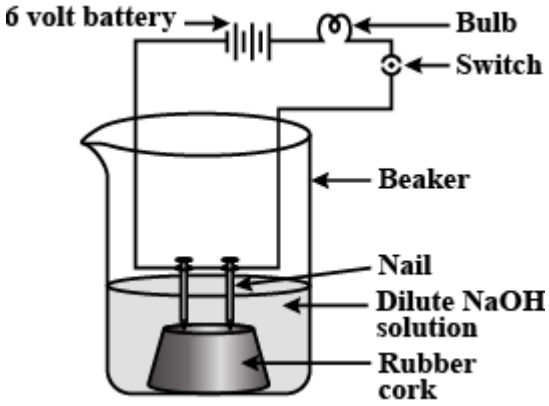
*v. **Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words*

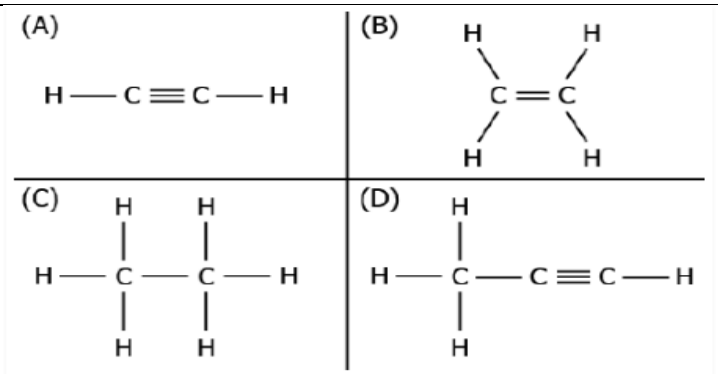
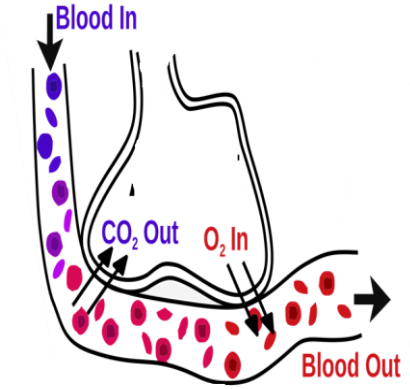
*vi. **Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.*

*vii. **Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

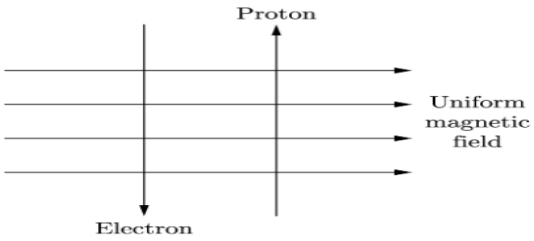
SECTION - A Select and write one most appropriate option out of the four options given for each of the questions 1 – 20		
Q. No	Questions	Marks
1	What happens when dilute hydrochloric acid is added to iron fillings as shown in the figure?  	1

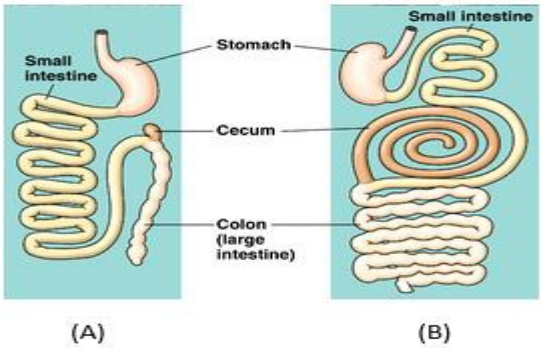
<table>
<tr><td></td><td>(a) Hydrogen gas and iron chloride are produced.
(b) Chlorine gas and iron hydroxide are produced.
(c) No reaction takes place.
(d) Iron salt and water are produced.</td><td></td></tr>
<tr><td>2</td><td>$CuO + H_2 \rightarrow Cu + H_2O$
Which of the following pairs is correct regarding to oxidation and reduction?
<table><tr><td></td><td>Oxidation</td><td>Reduction</td></tr><tr><td>(a)</td><td>CuO</td><td>H_2</td></tr><tr><td>(b)</td><td>H_2</td><td>CuO</td></tr><tr><td>(c)</td><td>H_2O</td><td>H_2</td></tr><tr><td>(d)</td><td>H_2</td><td>H_2O</td></tr></table></td><td>1</td></tr>
<tr><td>3</td><td>Test tubes A, B and C contain zinc sulphate, silver nitrate and iron (II) sulphate solutions respectively as shown in the figure. Copper pieces are added to each test tube. Blue colour will appear in case of
 
(a) Test tube A
(b) Test tube B
(c) Test tube C
(d) All the test tubes</td><td>1</td></tr>
<tr><td>4</td><td>An aqueous solution turns the red litmus solution blue. Excess addition of which of the following solutions would reverse the change?
(a) Baking powder
(b) Lime
(c) Ammonium hydroxide solution
(d) Hydrochloric acid</td><td>1</td></tr>
</table>

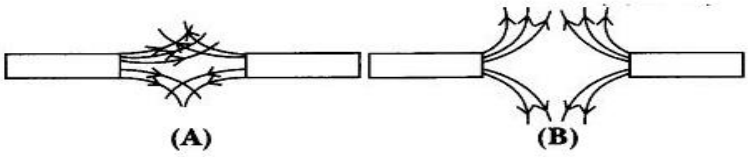
5	In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus was set up. Which among the following statement(s) is (are) correct?  (i) Bulb will not glow because the electrolyte is not acidic. (ii) Bulb will glow because NaOH is a strong base and furnishes ions for conduction. (iii) Bulb will not glow because the circuit is incomplete. (iv) Bulb will not glow because its glowing depends upon the type of electrolytic solution. (a) (i) and (iii) (b) (ii) and (iv) (c) (ii) only (d) (iv) only	1
6	10ml solution of NaOH is found to be completely neutralised by 8ml of a given solution of HCl. If we take 20ml of same solution of NaOH, the amount of HCl solution required to neutralise it will be (a) 4 ml (b) 8 ml (c) 12 ml (d) 16 ml	1
7	The image represents the structure of a few hydrocarbon compounds.	1

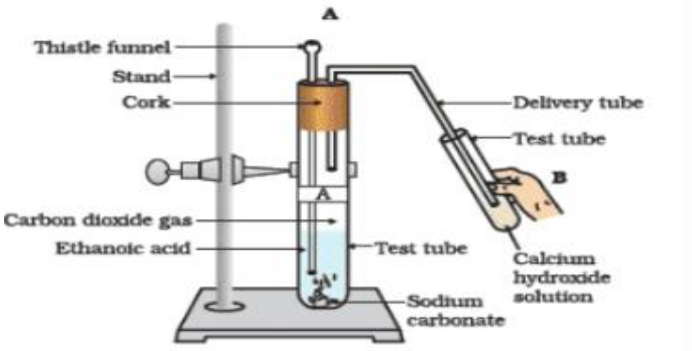
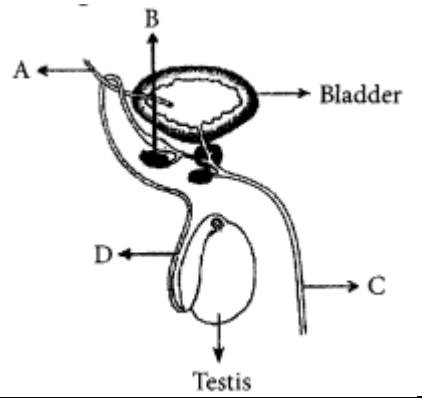
	 Which of these compounds can be classified as alkynes? (a) only (A) (b) only (B) (c) both (A) and (D) (d) both (B) and (C)	
8	Observe the diagrammatic representation of a process happening in our body.  In which of these regions or organs could it be taking place? (i) Lungs (ii) Heart (iii) kidneys (a) Only in lungs (b) Only in heart (c) Only lungs and kidneys (d) In all lungs, heart and kidneys	1
9	Vijay's neighbour had moved on to some other location. He notices a pot lying in his neighbour's compound. Which type of tropism did he observe in the fallen pot?  (a) Hydrotropism	1

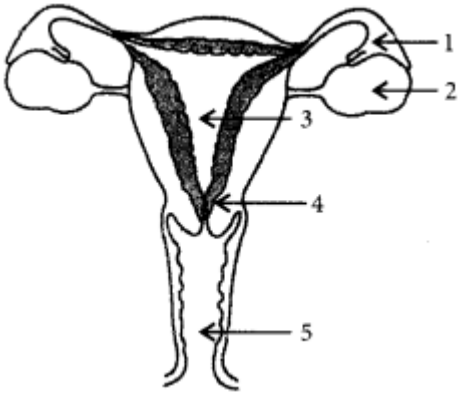
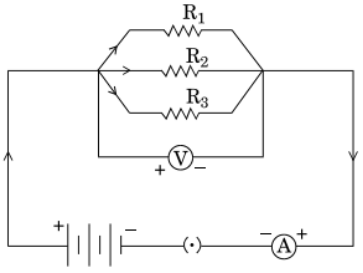
	(b) Phototropism (c) Geotropism (d) Chemotropism	
10	The method used for growing Jasmine and Rose are – (a) Jasmine by fragmentation and Rose by regeneration (b) Jasmine by regeneration and Rose by fragmentation (c) Jasmine by layering and Rose by cutting (d) Jasmine by cutting and Rose by layering	1
11	A zygote which has an X-chromosome inherited from the father will develop into a: (a) boy (b) girl (c) X-Chromosome does not determine the sex of a child (d) either boy or girl	1
12	In peas, a pure round seed plant (RR) is crossed with a pure wrinkled seed plant (rr). The ratio of pure round seed plants to pure wrinkled seed plants in F_2 is (a) 1 : 3 (b) 3 : 1 (c) 1 : 1 (d) 2 : 1	1
13	R_1 and R_2 be the resistance of the filament of 40 W and 60 W respectively operating 220 V, then (a) $R_1 < R_2$ (b) $R_2 < R_1$ (c) $R_1 = R_2$ (d) $R_1 \geq R_2$	1
14	A cylindrical conductor of length 'l' and uniform area of cross-section 'A' has resistance 'R'. The area of cross-section of another conductor of the same material and same resistance but of length '2l' is (a) A/2 (b) 3A/2 (c) 2A (d) 3A	1
15	A uniform magnetic field exists in the plane of paper pointing from left to right as shown in figure. In the field an electron and a proton move as shown. The electron and the proton experience	1

	 (a) Forces both pointing into the plane of paper (b) Forces both pointing out of the plane of paper (c) Forces pointing into the plane of paper and out of the plane of paper, respectively. (d) Force pointing opposite and along the direction of the uniform magnetic field respectively.	
16	Which one of the given statements is not true? (a) In a house circuit, lamps are used in parallel (b) Switches, fuses and circuit breakers should be placed in the neutral wire (c) An electric iron has its earth wire connected to the metal case to prevent the user receiving a shock (d) When connecting a three-core cable to a 13 A three pin plug, the red wire goes to the live pin	1
Q. no 17 to 20 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: (a) Both A and R are true and R is the correct explanation of A (b) Both A and R are true and R is not the correct explanation of A (c) A is true but R is false (d) A is False but R is true		
17	Assertion (A): - AgBr is used on photographic films. Reason(R): - AgBr is photosensitive and changes to Ag and bromine in presence of sunlight and undergoes decomposition reaction.	1
18	Assertion (A)**:** Lipases help in the emulsification of fats. Reason(R)**:** Lipases hydrolyses fats and oils.	1
19	Assertion (A): Mendel selected the pea plant for his experiments. Reason (R): Pea plant is cross-pollinating and has unisexual flowers.	1
20	Assertion (A): The magnetic field inside a solenoid is uniform. Reason(R): The magnetic field lines inside a solenoid are parallel.	1
SECTION – B		

Q. no. 21 to 26 are very short answer questions		
21	Generally when metals are treated with mineral acids, hydrogen gas is liberated. But when metals (except Mg and Mn) are treated with HNO_3, hydrogen is not liberated. Why? OR Why does calcium start floating when added to water? Write chemical equation for the reaction between calcium and water.	2
22	The length of the small intestine differs in various animals depending on the food they eat. Identify which of the two belongs to a carnivore and herbivore respectively. Justify your answer with a reason.  	2
23	Name the component of blood which transport: (i) Carbon dioxide, food and nitrogenous wastes (ii) Oxygen	2
24	Sheetal was chopping vegetables while watching television in the drawing room. Suddenly, she smells something burning and sees smoke in the kitchen. She rushes out to the kitchen immediately. Was Sheetal's action voluntary or involuntary?	2
25	A person is unable to see distinctly the objects closer than 1 m. Name the defect of vision he is suffering from. Draw ray diagrams to illustrate the cause of the defect and its correction by suitable lens.	2
26	What is the significance of food chain in an ecosystem?	2
SECTION - C Q.no. 27 to 33 are short answer questions.		
27	On heating lead nitrate in a boiling tube, lead oxide, oxygen gas and a brown gas X is formed. (a) Write a balanced chemical equation of the reaction (b) Identify the brown gas X evolved. (c) Identify the type of reaction.	3
28	(a) How is copper obtained from its sulphide ore? Give equations of the reactions.	3

	(b) In the electrolytic refining of metal M, name the cathode and the anode.	
29	How do leaves of plants help in excretion? OR Give reasons: i) Respiratory rate in aquatic organisms is higher than in terrestrial organisms. ii) Capillaries are the thinnest blood vessels. iii) Trachea does not collapse when there is no air in it.	3
30	Magnetic field lines of two magnets are shown in fig. A and fig. B.  i. Select the figure that represents the correct pattern of field lines. ii. Give reasons for your answer. iii. Also name the poles of the magnets facing each other	3
31	(a) Explain the term 'absolute refractive index of a medium' and write an expression to relate it with the speed of light in vacuum. (b) Calculate the refractive index of the material of a glass slab. Given that the speed of light through the glass slab is 2×10^8 m/s and in air is 3×10^8 m/s.	3
32	(a) Name the type of mirror used in the following and reason for using it: i. Solar furnace ii. Rear view mirror in a vehicle (b) A real image, $1/5^{th}$ the size of the object, is formed at a distance of 18 cm from a mirror. What is the nature of the mirror? Calculate its focal length. OR (a)What is meant by power of a lens? Write its SI unit. (b)A student uses a lens of focal length 40 cm and another of –20 cm. Write the nature and power of each lens.	3
33	i) With the help of equations, explain the formation of ozone in the atmosphere.	3

	ii) Suggest any two methods to manage the disposal of non-biodegradable waste.	
	SECTION - D Q.no. 34 to 36 are Long answer questions.	
34	a) Two carbon compounds X and Y have the molecular formula C_3H_6 and C_4H_{10} respectively. Which one of the two is most likely to show addition reaction? Justify your answer. AIso give the chemical equation to explain the process of addition reaction in this case. b) Draw the structure of the following compounds and identify the functional group present in them: i) butanoic acid ii) bromopropane OR a) Observe the figure below and answer the following questions  (i) What change would you observe in the calcium hydroxide solution taken in test tube B? (ii) Write the reaction involved in test tube A (iii) Would you expect the same change if ethanol is given instead of ethanoic acid? b) Define isomerism. Draw all possible isomers of butane.	5
35	Based on the given diagram answer the questions given below:  	5

	(a) Label the parts A, B, C and D. (b) Name the hormone secreted by testis and mention its role. (c) State the functions of B and C in the process of reproduction. **OR** (a) Identify the given diagram. Name the parts 1 to 5.  (b) What is contraception? List three advantages of adopting contraceptive measures.	
36	In the circuit given below, the resistors R_1, R_2 and R_3 have the values 10 Ω, 20 Ω and 30 Ω respectively, which have been connected to a battery of 12 V.  (a) Calculate (i) the current through each resistor, (ii) the total circuit resistance, and (iii) the total current in the circuit. (b) Find the minimum resistance that can be made using four resistors, each of 20 Ω.	5
SECTION – E Q.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	Sample pieces of five metals P, Q, R, S and T are added to the tabulated solutions separately. The results observed are shown in the table given below.	4

	Metal	Solutions			
		$CuSO_4$	$ZnSO_4$	$FeSO_4$	$AgNO_3$
	P	No change	No change	No change	A coating on metal
	Q	Brown coating	----------	Grey deposit	A coating on metal
	R	No change	No change	No change	No change
	S	----------	No change	No change	Brown deposit
	T	Brown deposit	New coating	New coating	New coating
	Based on the observations recorded in the table, answer the following questions. (i) Which is the most reactive metal? (ii) Arrange P, Q, R, S and T in the increasing order of reactivity. (iii) Which of the following listed metals can displace Zinc from its salt solution? Give reason for your answer. Copper, Lead, Magnesium, Silver. OR (iii) What will you observe when iron nails are dipped in copper sulphate solution? Write the chemical equation of the reaction.				
38	Visit any town or city, and we are sure to find heaps of garbage all over the place. Visit any place of tourist interest and we are sure to find the place littered with empty food wrappers. Improvements in our life-style have resulted in greater amounts of waste material generation. Changes in attitude also have a role to play, with more and more things we use becoming disposable. Changes in packaging have resulted in much of our waste becoming non-biodegradable. What do you think will be the impact of these on our environment? (i) What are non-biodegradable substances? (ii) Mention one reason for much of our waste becoming non-biodegradable. (iii) List two biodegradable and non-biodegradable substances from your kitchen. OR (iii) Write two difference between biodegradable and non-biodegradable substances				4

39	A student focused the image of a candle flame on a white screen by placing the flame at various distances from a convex lens. He noted his observations as follows	4

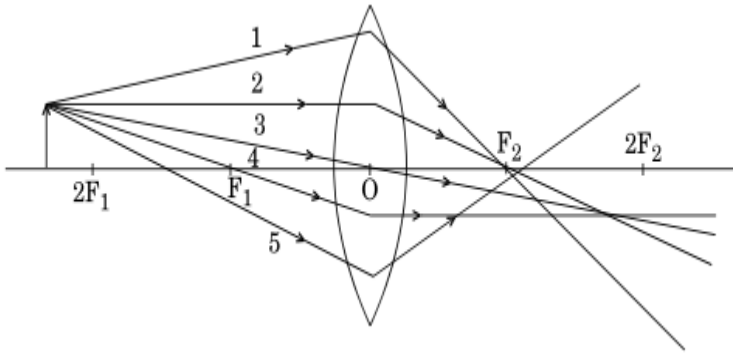
S. No	Distance of flame from the lens (cm)	Distance of the scree from the lens (cm)
1	60	20
2	40	24
3	30	30
4	24	40
5	15	70

(i) From the above table, find the focal length of lens without using lens formula.

(ii) Which set of observation is incorrect? Justify your answer

(iii) Out of the five incident rays shown in the following diagram,

find any two incident rays that are obeying the laws of refraction of light and may be used for locating the position of the image formed by a convex lens. Use these two rays in finding the position, size and nature of the image formed when an object is placed between F_1 and $2F_1$ of a convex lens.



OR

(iii) The magnification of an image formed by a lens is −1. If the distance of the image from the optical centre of the lens is 25 cm, where is the object placed? Draw a labelled diagram to show the image formation in this case.