PACE
IIT & MEDICAL

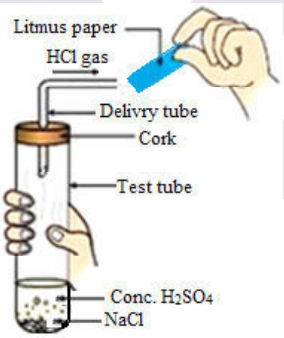
Sub. : Science
Std. X (CBSE)

Prelim Question Paper - 02

Total Marks : 80
Time : 3 Hours

SECTION - A

Select and write one most appropriate option out of the four options given for each of the questions 1 – 20

No.	Questions	Marks
1.	The figure given below represents the experiment carried out between conc. sulphuric acid and sodium chloride, which react with each other to form HCl gas. Blue litmus paper is brought near the mouth of the delivery tube to check the presence of HCl acid but no change is observed in the color of litmus paper because:  a) The litmus paper used is dry b) The litmus paper used is moist c) Blue litmus paper does not change its color with an acid d) The litmus paper is kept very close to the mouth of the delivery tube	1
2.	In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate? a) Lead sulphate (insoluble) b) Lead acetate c) Ammonium nitrate d) Potassium sulphate	1
3.	In the reaction which option in the given table correctly represents the substance oxidized and the reducing agent? $CuO + H_2 \longrightarrow Cu + H_2O$	1

Option	Substance Oxidized	Reducing Agent
a	H_2	H_2
b	H_2	Cu
c	H_2O	CuO
d	CuO	H_2

4. Reaction between X and Y forms compound Z. X loses electron and Y gains electron. Which of the following properties is not shown by Z? 1

a) Has high melting point
b) Has low melting point
c) Conducts electricity in molten state
d) Occurs as solid

5. Which of the following statements about the given reaction are correct?

$3Fe(s) + 4H_2O(g) \rightarrow Fe_3O_4(s) + 4H_2(g)$

i) Iron metal is getting oxidised
ii) Water is getting reduced
iii) Water is acting as reducing agent
iv) Water is acting as oxidising agent

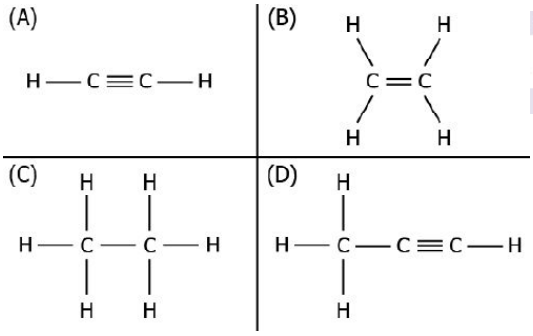
a) (i), (ii) and (iii) b) (iii) and (iv) c) (i), (ii) and (iv) d) (ii) and (iv)

6. Which of the following acids are edible? 1

A) Citric acid B) Tartaric acid C) Hydrochloric acid D) Carbonic acid

a) (A) and (B) are correct
b) (A), (B) and (D) are correct
c) (A), (B) and (C) are correct
d) All are correct

7. The image represents the structure of a few hydrocarbon compounds. 1



Which of these compounds can be classified as alkynes?

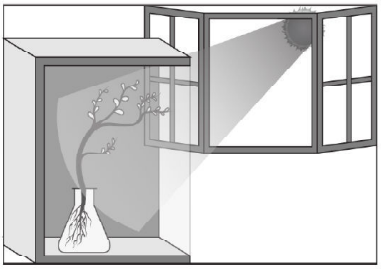
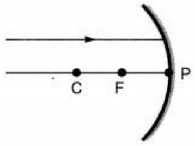
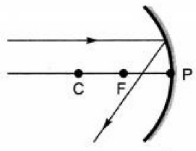
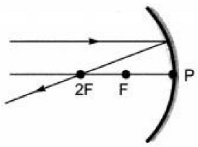
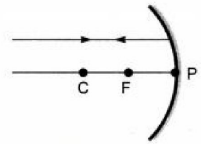
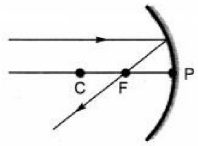
a) only (A) b) only (B) c) both (A) and (D) d) both (B) and (C)

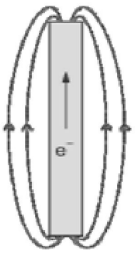
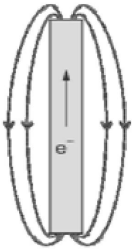
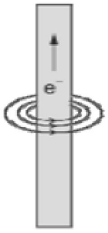
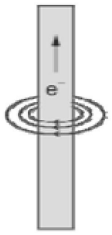
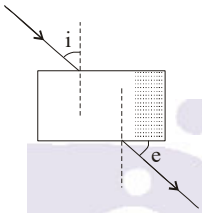
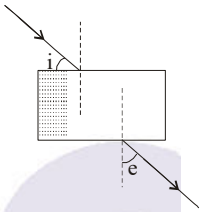
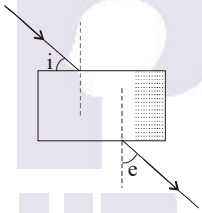
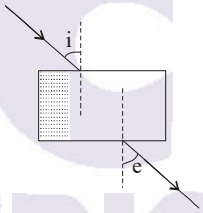
8. The anther contains 1

a) Sepals b) Ovules c) Carpels d) Pollen grains

9. The development of a seedling from an embryo under appropriate condition is called 1

a) Regeneration
b) Germination
c) Vegetative propogation
d) Pollination

10.	Two pea plants one with round green seeds (RR yy) and another with wrinkled yellow (rrYY) seeds produce F_1 progeny that have round yellow (RrYy) seeds. When F_1 plants are self pollinated, the F_2 progeny will have a new combination of characters. Choose the new combinations from the following: i) Round, yellow ii) Round, green iii) Wrinkled, Yellow iv) Wrinkled, green a) (i) and (ii) b) (i) and (iv) c) (ii) and (iii) d) (i) and (iii)	1
11.	Raghav potted some germinated seeds in a pot. He put the pot in a cardboard box that was open from one side. He keeps the box in a way that the open side of the box faces sunlight near his window. After 2-3 days he observes the shoot bends towards light as shown in image.  Which type of tropism does he observe? a) Geotropism b) Phototropism c) Chemotropism d) Hydrotropism	1
12.	Which option correctly shows the path that the sperms take when they are released from the male reproductive system? a) testis → ureter → urethra → penis b) testis → vas deferens → ureter → penis c) testis → ureter → vas deferens → penis d) testis → vas deferens → urethra → penis	1
13.	Which of the following ray diagrams is correct for the ray of light incident on a concave mirror as shown in figure?  A)  B)  C)  D)  a) Fig. A b) Fig. B c) Fig. C d) Fig. D	1

14.	Which of the following diagrams correctly shows the magnetic field produced by a current- carrying wire? A)  B)  C)  D)  a) A b) B c) C d) D	1
15.	A student does the experiment on tracing the path of a ray of light passing through a rectangular glass slab for different angles of incidence. He can get a correct measure of the angle of incidence and the angle of emergence by following the labelling indicated in figure: I)  II)  III)  IV)  a) I b) II c) III d) IV	1
16.	The direction of force on a current carrying conductor in a magnetic field is given by. a) Fleming's left hand rule. b) Fleming's right hand rule. c) Right hand thumb rule. d) Left hand thumb rule.	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) :** Iron displaces copper from aqueous solution of copper sulphate	1

	Reason (R) : In a single displacment reaction, a more reactive metal displaces the less reactive metal from its aqueous salt solution.	
18.	**Assertion(A):** The four chambered heart does not mix oxygenated and deoxygenated blood. **Reason(R):** Four chambered heart is found in mammals with advanced body functions	1
19.	**Assertion :** Transpiration is a necessary evil. **Reason :** It causes water loss but help in absorption & upward movement of water & minerals.	1
20.	**Assertion(A) :** Danger signals are made of red colour. **Reason (R) :** Velocity of red light in air is maximum, so signals are visible even in dark.	1
	SECTION – B **Q. no. 21 to 26 are very short answer questions.**	
21.	Write balanced chemical equation for the following reaction. i) Silver bromide on exposure to sunlight decomposes into silver and bromine. ii) Sodium metal reacts with water to form sodium hydroxide and hydrogen gas. **OR** Identify the type of reaction (s) in the following equation. i) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ ii) $Pb(NO_3)_2 + 2KI \rightarrow PbI_2 + 2KNO_3$ iii) $CaO + H_2O \rightarrow Ca(OH)_2$ iv) $CuSO_4 + Zn \rightarrow ZnSO_4 + Cu$	2
22.	a) Name the part of brain which controls (i) voluntary action, (ii) involuntary action. b) What is the significance of the peripheral nervous system? Name the components of this nervous system and distinguish between the origin of the two.	2
23.	What is reproduction? Mention the importance of DNA copying in reproduction.	2
24.	How do guard cells regulate opening and closing of stomatal pores?	2
25.	Draw a ray diagram of image formed by a concave mirror when the object is placed at the centre of curvature of the mirror. **OR** A convex lens of power 4D is placed at a distance of 40 cm from a wall. At what distance from the lens should a candle be placed so that its image is formed on the wall?	2
26.	What does a trophic level represent in a food chain? State the position of autotrophs and herbivores in a food chain.	2

	SECTION - C **Q.no. 27 to 33 are short answer questions.**	
27.	Write balanced chemical equations for the following chemical reactions: a) Hydrogen + Chlorine $\rightarrow$ Hydrogen chloride b) Lead + Copper chloride $\rightarrow$ Lead chloride + Copper c) Zinc oxide + Carbon $\rightarrow$ Zinc + Carbon monoxide.	3
28.	Classify the following salts as acidic, basic or neutral. a) NaCl b) Na_2SO_4 c) $CaCl_2$ d) K_2CO_3 e) K_2SO_4 f) KCl	3
29.	Name three different glands associated with the digestive system in humans. Also name their secretions. **OR** a) Name two different ways in which glucose is oxidised to provide energy in various organisms. b) Write any two differences between the two ways of oxidation of glucose in organisms.	3
30.	A concave mirror is used for image formation for different positions of an object. What inferences can be drawn about the following when an object is placed at a distance of 10 cm from the pole of a concave mirror of focal length 15 cm? a) Position of the image b) Size of the image c) Nature of the image Draw a labelled ray diagram to justify your inferences.	3
31.	Draw a schematic diagram of a circuit consisting of a battery of 3 cells of 2 V each, a combination of three resistors of $10\,\Omega$, $20\,\Omega$ and $30\,\Omega$ connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the following: a) Current through each resistor b) Total current in the circuit c) Total effective resistance of the circuit.	3
32.	Define alternating current and direct current. Explain why alternating current is preferred over direct current for transmission over long distances. **OR** i) Alternating current has a frequency of 50 Hz. What is meant by this statement? How many times does it change its direction in one second? Give reason for your answer. ii) Mention the frequency of D.C that is given by a cell.	3

33.	What is biological magnification? Will the levels of this magnification be different at different levels of the ecosystem?	3
	SECTION - D **Q.no. 34 to 36 are Long answer questions.**	
34.	a) In the formation of compound between two atoms A and B, A loses two electrons and B gains one electron. i) What is the nature of bond between A and B? ii) Suggest the formula of the compound formed between A and B. b) On similar lines explain the formation of $MgCl_2$ molecule. c) Common salt conducts electricity only in the molten state. Why? d) Why is melting point of NaCl high? OR a) Name the main ore of mercury. How is mercury obtained from its ore? Give balanced chemical equation. b) What is thermite reaction? How is it used to join the railway tracks or cracked machine parts? c) Name the method used to extract metals of high reactivity.	5
35.	a) Write the functions of the following in human female reproductive system. i) Ovary ii) Oviduct iii) Uterus. b) How does the embryo get nourishment inside the mother's body? Explain in brief. **OR** a) How many eggs are produced every month by either of the ovaries in a human female? Where does fertilization take place in the female reproductive system ? b) What happens in case of egg released by the ovary is not fertilized ?	5
36.	What is solenoid? Draw the pattern of magnetic field lines of (i) a current carrying solenoid and (ii) a bar magnet. List two distinguishing features between the two fields. **OR** A current carrying conductor is placed in a magnetic field. Now answer the following. (i) List the factors on which the magnitude of force experienced by conductor depends. (ii) When is the magnitude of this force maximum? (iii) State the rule which helps, in finding the direction of motion of conductor. (iv) If initially this force was acting from right to left, how will the direction of force change if: (a) direction of magnetic field is reversed? (b) direction of current is reversed?	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.	**Case Study** pH is quite useful to us in a number of ways in daily life. Some of its applications are: Control of pH of the soil :Plants need a specific pH range for proper growth. The soil may be acidic, basic or neutral depending upon the relative concentration of H^+ and OH^- . The pH of any soil can be determined by using pH paper. If the soil is too acidic, it can be corrected by adding lime to it. If the soil is too basic, it can be corrected by adding organic manure which contains acidic materials. Regaining shine of a tarnished copper vessel by use of acids :A copper vessel gets tarnished due to formation of an oxide layer on its surface. On rubbing lenion on the vessel, the surface is cleaned and the vessel begins to shine again. This is due to the fact that copper oxide is basic in nature, which reacts with the acid (citric acid) present in lemon to form a salt (copper citrate) which is washed away with water. As a result, the layer of copper oxide is removed from the surface of the vessel and the shining surface is exposed. Self-defence by animals through chemical warfare : Stings of bees and ants contain methanoic acid. When stung, it causes lot of pain and irritation. This can be cured by rubbing the affected area with mild base like baking soda.	
a)	What happened when black copper oxide placed in a beaker is treated with dilute HCl?	1
b)	Which acids is present in bee sting?	1
c)	P is an aqueous solution of acid and Q is an aqueous solution of base. When these two are diluted separately, then what happened? **OR** Sting of ant can be cured by rubbing the affected area with soap .Give reason	2
38.	**Case Study :** The male reproductive system consist of portions which produce the germ-cells and other portions that deliver the germ-cells to the site of fertilisation. Testes are located outside the abdominal cavity in scrotum because sperm formation requires a lower temperature than normal body temperature. It also has a role of secretion of male sex hormone which brings changes in appearance seen in boys at the time of puberty. Vas deferens unites with a tube coming from urinary bladder. Urethra is a common passage for sperms and urine. Prostate gland and seminal vesicles add their secretions so that sperms are now in fluid.	
a)	Name the sex hormone associated with males.	1
b)	What is the function of prostate gland and seminal vesicles?	1
c)	Give reason:Testes are located outside the abdominal cavity in scrotum . **OR** Give reason:Testes secrete the male sex harmone.	2

39.	**Case Study :** An insulated copper wire wound on a cylindrical cardboard tube such that its length is greater than its diameter is called a solenoid. When an electric current is passed through the solenoid, it produces a magnetic field around it. The magnetic field produced by a current-carrying solenoid is similar to the magnetic field produced by a bar magnet. The field lines inside the solenoid are in the form of parallel straight lines. The strong magnetic field produced inside a current-carrying solenoid can be used to magnetise a piece of magnetic material like soft iron, when placed inside the solenoid. The strength of magnetic field produced by a current carrying solenoid is directly proportional to the number of turns and strength of current in the solenoid.	
a.	Define solenoid.	1
b.	A long solenoid carrying a current produces a magnetic field B along its axis. If the current is double and the number of turns per cm is halved, then what is the new value of magnetic field ?	1
c.	Compare the magnetic field produced by the solenoid and by the bar magnet.	2
	OR List factors on which the strength of the magnetic field lines produced by a solenoid depends.	
	* * *	