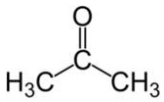
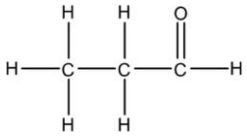
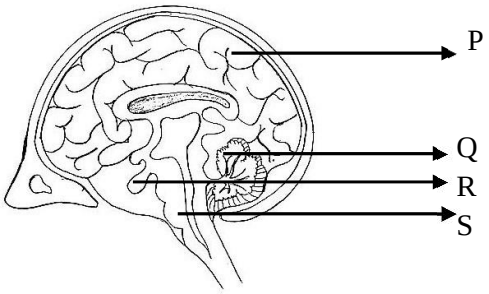
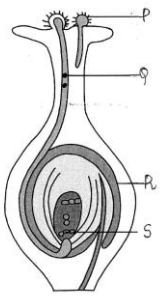
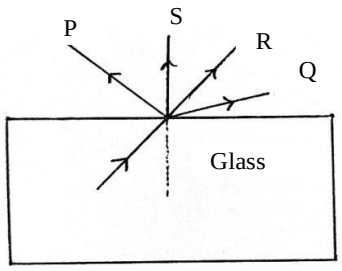
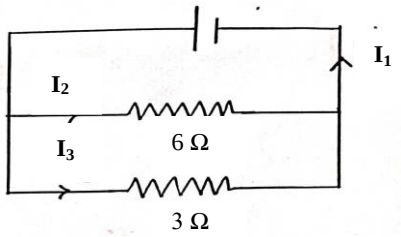
BANGALORE SAHODAYA QUESTION PAPER (2022-23)
Science (Code – 086)
CLASS X –SET 1

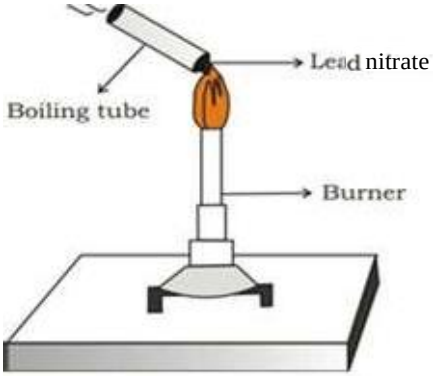
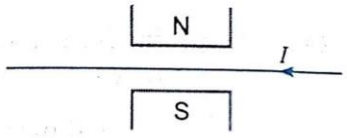
Maximum Marks: 80 **Time allowed: 3 Hrs**
Date :

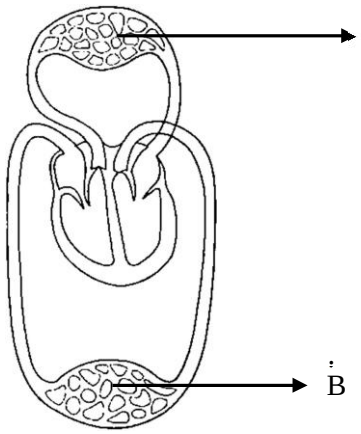
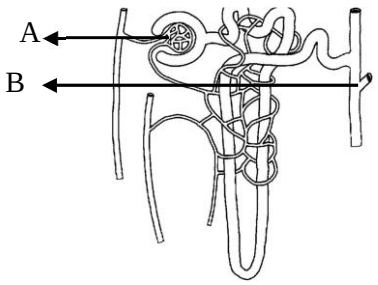
	General Instructions: i. This question paper consists of 39 questions in 5 sections. ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions. iii. Section A consists of 20 objective type questions carrying 1 mark each. iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be 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 be 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.	Which of the following is true about dilution of an acid a) The strength of the acid does not change on dilution b) The concentration of hydronium ions increases per unit volume c) Water is added to the acid by stirring continuously d) The concentration of hydroxide ions increases per unit volume	1
2.	Which statement about the reaction is correct? $2Al + 3H_2O \text{ -----> } Al_2O_3 + 3H_2$ i) Aluminium is oxidised to aluminium oxide ii) Hydrogen is oxidised to water iii) Aluminium oxide is reduced to aluminium iv) Water is reduced to hydrogen (a) ii and iii (b) i and iv (c) i and ii (d) iii and iv	1

3.	 **A**  **B** a) A is propanone and B is propanal b) A is propanal and B is propanone c) A is acetone and B is propanol d) A is propanol and B is propanal	1
4.	Which of the following statements is incorrect about anodizing a) It is a process of forming a thick oxide layer of aluminium on the article b) The thick Aluminium oxide coating will prevent corrosion of aluminium c) Oxygen evolved at the cathode, forms oxide coating on aluminium d) A clean aluminium article is taken as anode during this process	1
5.	Which observations support the law of conservation of mass for electrolytic decomposition of water. a) Gas bubbles are observed at both the electrodes b) Water level is more in the test tube covering the cathode c) The volume of gases evolved at anode and cathode is in the ratio of 1:2 d) The level of water is less in the test tube covering the anode	1
6.	An experiment was carried out on decomposition of sodium bicarbonate. Which among the following option is true about the nature of gaseous product formed? **Blue litmus. Red litmus** a) Changes colour Changes colour b) Changes colour No change in colour c) No colour change Changes colour. d) No colour change No colour change	1
7.	**Match the following** Cupric oxide on treating with dilute sulphuric acid produces copper sulphate solution. The observations and inferences for the reaction are given below: **Observation. Inference** i) Black color changes to blue. (p) Thermal decomposition reaction ii) Blue color changes to black. (q) Combination reaction iii) Black color changes to colorless (r) Neutralization reaction iv) Blue color changes to colorless (s) single displacement reaction a) i and p b) i and r c) ii and s d) iii and r	1

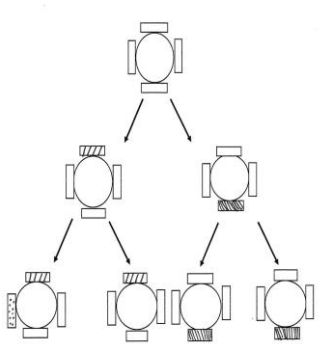
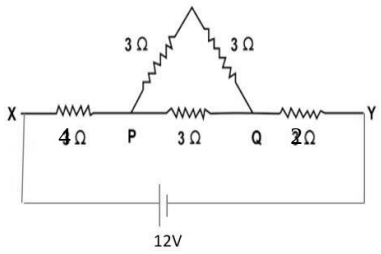
8.	Observe the given diagram and identify the mismatched combination/s  i. P – Cerebrum – Thinking and reasoning ii. Q – Cerebellum – Muscular coordination iii. R – Cerebellum – Thinking and reasoning iv. S – Pituitary – Regulates glands a. i and iii b. iii and iv c. ii and iii d. i and iv	**1**
9.	Out of the following test tubes which one will give blue black color on addition of iodine solution? a. Test tube 1 containing sugar solution, saliva and a few drops of acid. b. Test tube 2 containing wheat flour, saliva and a few millilitres of water. c. Test tube 3 containing sugar solution, saliva and a few drops of caustic soda. d. Test tube 4 containing wheat flour, saliva and a few drops of acid.	**1**
10.	Identify the function of nephrons in a healthy person. a. Produces nitrogenous waste b. Eliminates all salts c. Reabsorbs all water d. Reabsorbs all amino acids	**1**
11.	In a plant, the number of chromosomes present in a male gamete is sixteen. Which of the following statement is true? a. The egg cell and ovary has 16 chromosomes b. The anther and ovule has 16 chromosomes c. The egg cell has 16 chromosomes d. Cells of petals and sepals have 16 chromosomes	**1**
12.	Which of the following is the female gamete? a. P b. Q c. R d. S  	**1**

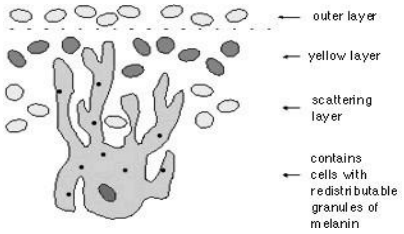
13.	The ratio of powers P_1 and P_2 of two lenses L_1 and L_2 is 1:4. The ratio of the focal lengths of L_1 and L_2 is a) 1:4 b) 4:1 c) 1:1 d) 2:1	**1**
14.	In the figure, a beam of light is travelling from a glass slab to air. Which of the marked paths will the emergent ray of light take a) P b) R c) Q d) S 	**1**
15.	. Which of the following options depict the correct relation between I_1, I_2, and I_3 in the circuit shown below? a) $I_1 < I_2$ and $I_2 > I_3$ b) $I_1 > I_2$ and $I_2 > I_3$ c) $I_1 > I_3$ and $I_3 < I_2$ d) $I_1 > I_3$ and $I_3 > I_2$ 	**1**
16.	A wire is stretched to four times its original length. If the radius of the original wire is 'r', the radius of the stretched wire will be a) $\frac{r}{2}$ b) $\frac{r}{4}$ c) 2r d) 4r	**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 : Pale green colored ferrous sulphate crystals turn white on heating. Reasoning: The compound is undergoing thermal decomposition reaction.	**1**
18.	Assertion : Men have either 'X' or 'Y' chromosome as the sex chromosome. Reason : Men have a mismatched pair of sex chromosome.	**1**
19.	Assertion : Rings of cartilage are present in the trachea. Reasoning : Lungs always contain a residual volume of air.	**1**
20.	Assertion : A 25W bulb glows brighter than 50W bulb when both are connected in series to a potential difference of 220V. Reason : The potential difference across the 25W bulb is more than a 50W bulb in a series combination.	**1**

	SECTION – B **Q. no. 21 to 26 are very short answer questions**	
21.	Translate the following statements into balanced chemical equations a) Manganese dioxide on heating with aluminium powder produces Manganese and Aluminium oxide b) On passing steam over red hot iron produces Iron (II)(III) oxide and hydrogen gas. **OR**  a. List one observation for the above activity b. Write the balanced chemical equation for the reaction taking place above.	**2**
22.	a) Define tropic movement. b) Differentiate between the way in which muscle cells and cells of a sensitive plant change their shape.	**2**
23.	a) What are the receptors? Name the receptors for taste. b) How is efficient communication of information ensured between cells in a multicellular organism?	**2**
24.	a) Name the respiratory pigment in humans. What is its importance? b) What is the role of diaphragm in breathing?	**2**
25.	Draw the pattern of magnetic field lines around a current carrying circular loop. At which point is the magnetic field strength maximum. Name the rule that is used to determine the direction of the field lines. **OR** A current carrying wire is placed in the plane of the paper in a magnetic field as shown below. In which direction does the wire move? State the rule used to determine the direction of movement of the wire.  	**2** **2**

26.	Give reason- a) Varying quantity of pesticide residues are found even in animal meat. b) There are generally lesser number of individuals at higher trophic level compared to the previous level.	**2**
	SECTION – C **Q.no. 27 to 33 are short answer questions**	
27.	Compound 'X' is used in soda –acid fire extinguisher. (a) Identify 'X' . (b) Write the parent acid and parent base of 'X'. (c) 'X' is used to obtain 'Y' which is used to remove permanent hardness of water. (i) write the chemical formula and the common name of 'Y'. (ii) What are salts like 'Y' generally known as ?	**3**
28.	Give reason. a) Ionic compounds have high melting and boiling points. b) Potassium chloride salt does not conduct electricity. c) 24 carat gold is not used for making jewellery.	**3**
29.	Observe the given diagram and answer the questions-  **a)** Identify 'A'. How does its structure help in its function? **b)** How does 'B' help in the formation of lymph? **c)** What is the advantage of this type of circulation? **OR** a) Identify 'A'. What is the composition of the fluid that enters into 'A'? b) Why is the above structure coiled? c) Identify 'B'. What is its function?  	**3** **3**
30.	a) What is the function of a fuse wire? b) How is it connected with an appliance in a circuit? c) You are given three fuse wires of rating 5A, 10A and 15A. Which fuse wire will you choose for an electric iron rated at 1kW-220V?	3

31.	a) The far point of a defective eye is 150cm. identify the defect and list its causes. b) Draw the ray diagram to show the correction of the defect.	3
32.	a) Draw the ray diagram to show the use of a concave mirror as a shaving mirror. b) The focal length of a concave mirror is 24cm. Where is the image formed if the object is placed at a distance of 16cm from the mirror? Write the nature of the image. **OR** The angle of refraction in media P, Q and R is 45^0, 35^0 and 50^0 respectively for a given angle of incidence. In which medium will the velocity of light be i) Minimum ii) maximum? b) The refractive index of kerosene is 1.44. Calculate the speed of light in kerosene. Given the speed of light in vacuum is 3×10^8 m/s	3 3
33.	a) Improvements in our lifestyle has resulted in greater amounts of waste material generation. How? Suggest few ways to reduce this problem? b) Ozone that shields the earth's surface from harmful UV rays is formed in the presence of UV rays. How?	3
	SECTION – D **Q.no. 34 to 36 are Long answer questions**	
34.	C_2H_5O- is the incomplete formula to which an atom of hydrogen can be (a) Added to obtain compound 'A' . (b) Removed to obtain compound 'B' i) Write the structural formula for the compound 'A' and 'B' ii) Write the IUPAC names for the compound 'A' and 'B' iii) Identify the functional groups of compound 'A' and 'B' iv) With conditions write the equation for the oxidation of compound 'A' in the presence of an oxidizing agent. v) Give two uses of compound 'A' . **OR** 'X' and 'Y' are the 2 isomers of a compound with molecular formula C_6H_{12}. a) Write the structural formula of both the isomers. b) Which of the isomers will undergo addition reaction ? Why ? c) How many covalent bonds are there in C_6H_{12} ? d) Write the structural formula of the compound with the molecular formula C_6H_6.	5

35.	 a) Identify the mode of reproduction represented in the above figure. Name an organism that reproduces by the above method. b) Write one advantage and one disadvantage of the above mode of reproduction. c) Organisms in 2nd and 3rd row are similar but subtly different from each other. Give reason. d) Are these differences beneficial for the species? Justify your answer. **OR** a) Where does fertilization and implantation take place in female reproductive system? b) List the changes that take place in the uterus- i) After fertilization ii) If fertilization does not take place c) Write two advantages of using condoms. d) Government has fixed the marriageable age of boys to 21. What is the reason behind this?	5
36.	**(a)** Give reasons for the following: (i) Alloys are preferred as heating elements in domestic appliances. (ii) Series arrangement is not used in domestic circuits.  **(b)** In the circuit given below, calculate (i) total resistance (ii) total current (iii) power developed in the 2Ω resistor.	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.	Anhydrous carnallite is chemically magnesium chloride. This is taken for electrolysis. Electrolytic cell is equipped with steel cathode and graphite anode submerged in molten salt . The temperature is maintained between 680 ºC to 750 ºC to obtain the metal. Chlorine is the gaseous product evolved at anode and molten metal floats at the top of the salt bath near cathode. a) i) Name the metal extracted in the above extraction process.	

	ii) Write the chemical formula of the ore used. b) After the electrolysis of molten salt name the oxidized and reduced products. c) Show the formation of the chief component of the given ore through electron dot structure . **OR** Show the formation of the oxide of the above metal through electron dot structure.	
38.	Anthocyanin is a pigment responsible for the purple color in flowers of pea plants. They found that a gene 'A' encodes for a protein that controls the synthesis of anthocyanin and hence produces purple flowers. An allele 'a' codes for a non-efficient protein which interrupts anthocyanin production. Hence produces white flowers. a) Where are genes located in a pea plant? b) Identify the dominant and recessive trait and justify based on the above information. c) If a plant having genotype 'Aa' is crossed with a plant having genotype 'aa'. What will be the phenotypic ratio of the progeny? **OR** c) If a plant having genotype 'AA' is crossed with a plant having genotype 'Aa'. What will be the phenotype/s and genotype/s of the progeny?	
39.	**The changing colours of a chameleon**  The changing colours of a chameleon's skin is mostly due to special pigment-containing cells in its skin. Some of the colours is due to an effect similar to what causes the daytime sky to be blue.  Here is a schematic picture of a chameleon's skin.Under the layer of yellow pigmented cells is a layer of cells that contain tiny particles, much smaller than any of the wavelengths in visible light. When light having a mixture of colours strikes these cells, the blue part of the light is spread over a wide range of directions, while the red part is hardly scattered at all and mostly continues in its original direction. (a) Name the phenomena causing the daytime sky to be blue. (b) When a beam of visible light strikes the cells, why is the blue part of visible light spread over a wide range of directions . **OR** Why are "danger" signal lights red in colour? (c) Why does the sky appear black to an astronaut in space?	4