SCIENCE

PUBLIC EXAM & MODEL QUESTION PAPER QUESTIONS CHAPTER WISE

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CHAPTER 01 – CHEMICAL REACTIONS & EQUATIONS		
01.	The substance that is oxidised in the following chemical reaction is $MnO_2 + 4\ HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$ (A) HCl (B) MnO_2(C) $MnCl_2$ (D) H_2O	MQP1
02.	What is a chemical combination reaction?	MQP1 – 1
03.	Draw the diagram of the arrangement of apparatus to know the reaction of Zinc granules with dilute sulphuric acid and testing hydrogen gas and label the part that contain zinc granules and sulphuric acid.	MQP1 – 2 MQP2020–2
04.	Write the balanced chemical equations for the following chemical reactions. (i) Potassium bromide reacts with Barium iodide (ii) Zinc carbonate is heated **OR** Which coloured fumes are obtained when lead nitrate is heated? Write the balanced chemical equation for this reaction. Name the type of this chemical reaction.	MQP1 – 2
05.	In the following reactions, the chemical reaction that takes place in sunlight is A) $CaCO_3 \rightarrow CaO + CO_2$ B) $CuSO_4.5H_2O \rightarrow CuSO_4.5H_2O$ C) $2AgBr \rightarrow 2Ag + Br_2$ D) $2HgO \rightarrow 2Hg + O_2$	MQP2 – MCQ
06.	The chemical equation that represents neutralization reaction among the following is (A) $BaCl_2 + H_2SO_4 \rightarrow BaSO_4 + 2HCl$ (B) $MnO_2 + 4\ HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$ (C) $2\ NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$ (D) $AgNO_3 + HCl \rightarrow AgCl + HNO_3$	A2019 MCQ
07.	Name the brown fumes liberated when lead nitrate is heated. Write the balanced chemical equation for this reaction.	A2019–2
08.	Draw the diagram of the apparatus used in the electrolysis of water. Label the following parts. (i) Graphite rod (ii) Cathode.	A2019–2 J2019 – 3
09.	The possible chemical reaction among the following is (A) $FeSO_4 + Pb \rightarrow PbSO_4 + Fe$ (B) $ZnSO_4 + Fe \rightarrow FeSO_4 + Zn$ (C) $2\ AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2\ Ag$ (D) $PbCl_2 + Cu \rightarrow CuCl_2 + Pb$.	J2019 – MCQ
10.	$Fe_2O_3 + 2\ Al \rightarrow Al_2O_3 + 2\ Fe$. The type of above chemical reaction is (A) combination reaction (B) double displacement reaction (C) decomposition reaction (D) displacement reaction.	J2019 – MCQ
11.	Reactive metals are good reducing agents. The most suitable example related to this is A) $PbO + C \rightarrow Pb + CO$ B) $3MnO_2 + 4Al \rightarrow 2Al_2O_3 + 3Mn$ C) $ZnO + C \rightarrow Zn + CO$ D) $CuO + H_2 \rightarrow Cu + H_2O$	MQP2020–MCQ
12.	What is an exothermic reaction? Which of the following is an exothermic reaction? i) Heating calcium carbonate ii) Adding water to calcium oxide	MQP2020–1
13.	Explain the three types of decomposition reaction with the help of balanced chemical equation for each.	MQP2020–3
14.	The inner surface of solar cooker is coated with black paint to (A) absorb more heat (B) reflect light (C) prevent rusting (D) converge the light rays.	M2020 – MCQ
15.	The reaction between lead nitrate and potassium iodide solutions is an example for what types of chemical reaction? Explain. Write the balanced chemical equation for this reaction.	MQP2020–3
16.	An iron ring is to be coated with copper. How can we do this without using electricity?	M2020 - 1
17.	The reaction of Barium chloride with Aluminium sulphate solution is an example for which type of chemical reaction? Why? Write the balanced chemical equation for this reaction.	M2020 – 3
18.	Manufacturers of chips, flush the packets of chips with nitrogen gas. Why?	S2020 – 1

19.	Write the balanced chemical equations for the following chemical reactions. How can we confirm by observation that these chemical reactions are taking place? a) Lead nitrate is heated. b) Sodium sulphate reacts with Barium chloride.	S2020 – 3
20.	NaOH + HCl → NaCl + H2O. This chemical reaction is an example of A. neutralization reaction B. substitution reaction C. addition reaction D. combustion reaction	MQP2021–MCQ
21.	The gas liberated when sodium bicarbonate reacts with dilute hydrochloric acid is (A) hydrogen (B) nitrogen (C) carbon dioxide (D) nitrogen dioxide	S2021–1
22.	Draw the diagram of the arrangement of apparatus to show the electrolysis of water and label the 'graphite rod'.	MQP2022–2
23.	The reaction of lead with Copper Chloride solution is an example for which type of chemical reaction? Why? Write the balanced chemical equation for this reaction. **OR** Write the balanced chemical equations for the following reactions and identify the exothermic and endothermic reaction. i) heating of ferrous sulphate crystals. ii) calcium oxide reacts with water.	MQP2022–3
24.	The gas liberated at the cathode in the electrolysis of water is (A) Oxygen (B) Hydrogen (C) Chlorine (D) Nitrogen.	A2022–1
25.	ZnO + C → Zn + CO In this reaction name the reactant i) that is oxidised and ii) that is reduced.	A2022–1
26.	Draw the diagram of arrangement of the apparatus to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts : i) Zinc granules ii) Delivery tube.	A2022–3
27.	Write the balanced chemical equation for the following chemical reactions: i) Calcium carbonate → Heat Calcium oxide + Carbon dioxide ii) Hydrogen + Chlorine → Hydrogen chloride iii) Magnesium + Hydrochloric acid → Magnesium chloride + Hydrogen. OR Which type of chemical reaction takes place when an iron nail is dipped in copper sulphate solution? Why? Write a balanced chemical equation for this chemical reaction.	A2022–3
28.	The Chemical equation that represents neutralisation reaction among the following is (A) Sodium Hydroxide + Hydrochloric acid → Sodium Chloride + Water (B) Barium Chloride + Sulphuric acid → Barium sulphate + Hydro Chloric acid (C) Manganese dioxide + Hydrochloric acid → Manganese chloride + Water + Chlorine D) Silver nitrate + Hydrochloric acid →Silver chloride + Nitric acid	MQP–2023–MCQ
29.	Draw the diagram of the arrangement of apparatus to show electrolysis of water.	MQP–2023–1
30.	Silver chloride exposed to the sunlight turns grey colour. Why? Write the balanced chemical equation for this reaction and mention the type of reaction. OR Why does the colour of copper sulphate solution change when an iron nail is dipped into it? Write the balanced chemical equation for this reaction.	MQP–2023–3
31.	The reactants that exchange ions by reacting with each other and form a precipitate among the following are (A) $BaCl_2$ and Na_2SO_4 (B) Al_2O_3 and HCl (C) NaOH and H_2SO_4 (D) Na_2O and CO_2	A2023–MCQ
32.	Packets of chips are flushed with nitrogen gas. Why ?	A2023–1

33.	An iron nail is dropped into a test tube having copper sulphate solution. The iron nail gradually turns to brownish colour. Why ?	A2023–1
34.	Chips manufacturers, flush bags of chips with nitrogen gas because, to (A) prevent corrosion of chips (B) prevent chips from getting oxidised (C) make chips undergo rancidity (D) prevent the chips from getting reduced.	J2023–MCQ
35.	Name the product produced when calcium oxide reacts with water.	J2023–1
36.	Add same amount of barium chloride solution to a test tube containing 5 ml of sodium sulphate solution. Then i) Which insoluble white precipitate is formed ? ii) Name the ions responsible for the formation of white precipitate. iii) Mention the type of chemical reaction that took place here.	J2023–2

CHAPTER 02 – ACIDS, BASES & SALTS		
01.	The pH values of four solutions P, Q, R *and* S are 7.8, 1.0, 13.0 and 1.4 respectively. The solution having highest hydrogen ion concentration among them is (A) P (B) Q (C) R (D) S	MQP1
02.	In a bakery, baking powder was not added while preparing cake. The cake obtained was hard and small in size. What is the reason for this?	MQP1 – 1
03.	Explain the preparation of plaster of Paris with the help of balanced chemical equation.	MQP1 – 2
04.	In a fertile garden certain types of flower plants were not growing. After testing the soil of the garden it was found that its pH value is 5.The chemical that may be used to treat the soil is A) Sodium chloride B) Calcium hydroxide C) Urea D) Copper sulphate	MQP2 – MCQ
05.	Name the acid present in the stinging hair of nettle leaves.	A2019– 1
06.	Draw the diagram of arrangement of apparatus used to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts. (i) Soap solution (ii) Delivery tube.	A2019–2
07.	There is no change in the colour of red litmus and blue litmus paper when introduced into an aqueous solution of sodium chloride. After passing direct current through the same solution, red litmus changes to blue colour. Which product is responsible for this change? Mention any two uses of this product.	A2019–2
08.	Name the gas liberated when an acid reacts with metallic carbonate. Write the chemical equation of the reaction when this gas is passed through lime water. What is the colour of the precipitate obtained in this reaction? **OR** Give scientific reason: (i) While diluting an acid, the acid should be added to water. (ii) Plaster of Paris should be stored in a moisture–proof container.	J2019 – 2
09.	(i) What is neutralisation reaction? (ii) Name the products of chlor–alkali process. Write one use of each.	J2019 – 4
10.	Aqueous solutions of sodium chloride, sodium sulphate and calcium chloride are taken in three separate test tubes. Using aqueous barium chloride how do you identify sodium sulphate?	MQP2020–1
11.	When sulphuric acid is added to 1g sodium chloride taken in a test tube, which gas is released? What changes do you observe when you test the gas with dry and wet litmus paper? What conclusion do you draw by this experiment? **OR** The pH values of four solutions A, B, C and D are 5, 12, 8, 9 respectively. Arrange them in the increasing order of their hydroxyl ion concentration. Which solution among them has strong acidic property? Explain what happens if our mouth contains the pH of solution 'A'	MQP2020–3
12.	As the pH value of a neutral solution increases (A) basic property decreases and number of OH− ions increases (B) acidic property increases and number of H+ ions decreases (C) basic property increases and number of OH− ions increases (D) acidic property decreases and number of H+ ions increases.	M2020 – MCQ
13.	$CH_3 - CH_2OH \xrightarrow{Conc.\ H_2SO_4} CH_2 = CH_2 + H_2O$ This chemical reaction is A) Neutralization reaction because water is released B) Oxidation reaction because oxygen is removed from the reactant C) Addition reaction because hydrogen is added to the reactant D) Dehydration reaction because water is removed from the reactant	MQP2020– MCQ
14.	Write the products obtained when sodium oxide reacts with hydrochloric acid.	MQP2020–1
15.	Write any two chemical properties of acids.	MQP2020–2

16.	a) Name the gas released at anode during chlor-alkali process and mention the uses of this gas. b) Which gas is released when sodium carbonate reacts with hydrochloric acid? How do you test this gas? Write the word equation for this reaction. **OR** a) What happens if too much of acid is produced in the stomach? What is the remedy for this situation? b) What is water of crystallization? How is plaster of paris prepared? Write any two uses of plaster of paris.	MQP2020–4
17.	Agricultural scientists have suggested to add a certain amount of lime powder to an agricultural field. What may be the reasons for this? Explain.	M2020 – 2
18.	Draw the diagram of the apparatus to show that acid solution in water conducts electricity. Label the following parts: i) Dil. HCl solution ii) Rubber cork. **OR** Draw the diagram of arrangement of the apparatus to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts: i) Test tube ii) Soap solution.	M2020 – 2
19.	Draw the diagram of the arrangement of apparatus to show that acid solution in water conducts electricity and label the battery. **OR** Draw the diagram of the arrangement of apparatus showing the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning and label the zinc granules.	S2020 – 2
20.	Strips of zinc, iron, magnesium and copper are taken in the test tubes A, B, C and D respectively. Same quantity of ferrous sulphate solution is added to these test tubes. In which test tubes chemical reaction will occur? Why? Write the chemical equations for the reactions taking place here.	S2020 – 3
21.	Write the molecular formulae and two uses of each of the following compounds: a) Bleaching powder b) Plaster of Paris. **OR** What is a strong acid? Explain how tooth decay is caused. How can it be prevented?	S2020 – 3
22.	As the pH value of a solution decreases A. number of OH– ions increases B. number of H+ ions increases C. number of H+ ions decreases D. equal number of OH– and H+ ions	MQP2021–MCQ
23.	The gas liberated when sodium carbonate reacts with dilute hydrochloric acid is A. hydrogen B. chlorine C. nitrogen dioxide D. carbon dioxide	MQP2021–MCQ
24.	The substance that changes the colour of red litmus paper into blue colour A. sodium chloride solution B. lemon juice C. pure water D. sodium hydroxide solution	MQP2021–MCQ
25.	A compound that reacts with both acids as well as bases to produce salts and water is (A) aluminium oxide (B) copper oxide (C) iron oxide (D) sodium oxide	J2021–1
26.	The gas liberated when sodium carbonate reacts with dilute hydrochloric acid is (A) carbon dioxide (B) nitrogen dioxide (C) hydrogen (D) chlorine	J2021–1
27.	The substance that converts blue litmus paper into red colour is (A) lime water (B) pure water (C) sodium hydroxide solution (D) gastric juice	J2021–1
28.	An acid present in the stinging hair of nettle plant leaves is (A) methanoic acid (B) oxalic acid (C) citric acid (D) lactic acid	J2021–1
29.	The metal oxide that exhibits both acidic and basic properties is (A) aluminium oxide (B) sodium oxide (C) potassium oxide (D) magnesium oxide	S2021–1
30.	Observe the following table :	S2021–1

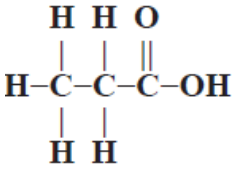
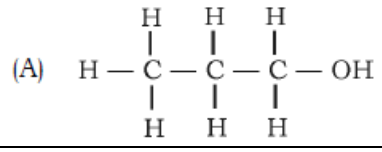
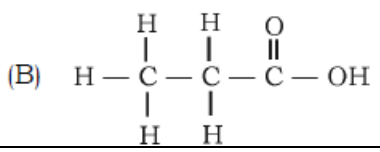
	The material that has very less hydrogen ions (H^+) among these is (A) R (B) S (C) Q (D) P	
31.	The substance that changes red litmus paper into blue colour is (A) sodium hydroxide solution (B) citric acid solution (C) sodium chloride solution (D) pure water	S2021–1
32.	As the pH value of a solution increases. A) number of H+ ions increases B) number of OH– ions increases C) number of OH– ions decreases D) equal number of H+ and OH– ions	MQP2022–MCQ
33.	Write the molecular formula and two uses of each of the following compounds a) Washing soda b) Bleaching powder **OR** Name the two gases liberated in Chlor-alkali process. Write one use of each.	MQP2022–2
34.	Write any two uses of Plaster of Paris.	A2022–1
35.	The pH values of *A, B* and *C* solutions are 5, 6 and 7 respectively. Which of these solutions is more acidic in nature ? Why ?	A2022–2
36.	The substance that converts red litmus paper into blue colour is (A) KOH Solution (B) distilled water (C) dilute solution of HCl (D) concentrated solution of HNO3	MQP–2023–MCQ
37.	Calcium oxide reacts with water to form slaked lime. What type of Chemical reaction is this? Write the balanced chemical equation for this reaction.	MQP–2023–2
38.	What is the chemical name of bleaching powder ? Write any two uses of it. OR What is concentrated acid? Name the acid present in the stinging hair of nettle leaves.	MQP–2023–3
39.	"Calcium oxide and carbon dioxide are produced on heating calcium carbonate." Write the balanced chemical equation for this reaction. Mention the type of this chemical reaction.	A2023–2
40.	Draw the diagram of arrangement of apparatus to show that acid solution in water conducts electricity and label dilute HCl solution.	A2023–2
41.	Name the salts used in the following situations and write their molecular formula: a) To remove permanent hardness of water. b) To make drinking water free from germs. c) To support fractured bones in their right position. OR a) The pH values of four solutions are given in the below table. Classify these into acidic and basic solutions : b) Name the antacid used to neutralise excess of acid in the stomach.	A2023–3
42.	Name the ions responsible for acidic and basic natures of the substances.	J2023–1
43.	a) Explain the manufacturing of bleaching powder. Write any two uses of it. b) A strong solution of sodium hydroxide is added to the strong solution of hydrochloric acid. What is the nature of the salt solution formed here ? Write a balanced chemical equation for this reaction.	J2023–4

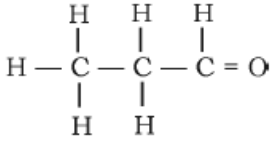
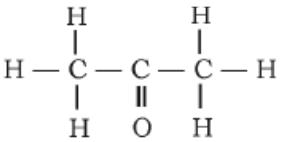
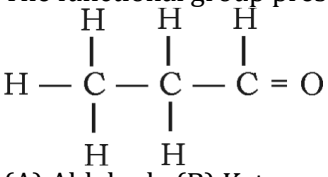
CHAPTER 03 – METALS & NON–METALS		
01.	Observe the following chemical equations and identify the correct statement. (i) $CuSO_4 + Fe \rightarrow FeSO_4 + Cu$ (ii) $2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$ (A) Copper is more reactive than Iron and Silver (B) Iron is less reactive than Copper and Silver (C) Copper is more reactive than Silver but less reactive than Iron (D) Silver is more reactive than Copper and Iron	MQP1
02.	Write the four properties of ionic compounds. **OR** Write any four physical properties of metals.	MQP1 – 2
03.	Draw the diagram of the apparatus used to test the conductivity of sodium chloride solution and label the graphite rod and the part where sodium chloride solution is present.	MQP1 – 3
04.	What is roasting in metallurgy?	A2019–1
05.	Give reasons: (i) Ionic compounds in solid state do not conduct electricity, whereas in molten state are good conductors of electricity. (ii) Silver articles when exposed to air gradually turn blackish. (iii) Chemical reaction does not take place when copper is added to iron sulphate solution. **OR** Give reasons: (i) "Alloys of iron are more useful when compared to pure iron." (ii) Copper loses its brown layer gradually when exposed to air. (iii) Aluminium oxide is called amphoteric oxide.	A2019–3
06.	(i) Write the balanced chemical equation for the reaction taking place when aluminium reacts with dilute hydrochloric acid. (ii) Hydrogen gas is not liberated when a metal reacts with concentrated nitric acid. Give reason. **OR** Show the formation of NaCl and $MgCl_2$ with the help of electron dot structure.	J2019 – 2
07.	Draw the diagram of the arrangement of apparatus to show the action of steam on a metal. Label the following parts: (i) Metal sample (ii) Delivery tube.	J2019 – 3
08.	Copper when exposed to air for a long time acquires a green coat. Why?	MQP2020–1
09.	What are ionic compounds? Mention any two properties of ionic compounds. **OR** Name any two metals that react with cold water vary quickly. Write the products formed when these metals react with cold water.	MQP2020–2
10.	Hydrogen gas is not liberated when a metal reacts with concentrated nitric acid because nitric acid A) does not contain hydrogen atoms B) oxidises itself C) oxidises hydrogen to form water D) is a strong reducing agent and gains hydrogen	MQP2020–MCQ
11.	Ferrous sulphate crystals are taken in a test tube and heated ; the correct statement related to this chemical reaction is A) This is a photolytic decomposition reaction, and white coloured solid ferric oxide is formed B) This is a thermal decomposition and green coloured fumes of ferric oxide is formed	MQP2020–MCQ

	C) This is a photolytic decomposition reaction and brown coloured fumes of ferric oxide is formed D) This is a thermal decomposition reaction and brown coloured solid ferric oxide is formed	
12.	Does the chemical reaction take place when zinc is added to ferrous sulphate solution? Justify your answer.	MQP2020–1
13.	Draw the diagram of the arrangement of apparatus to show the action of steam on a metal and label the part where hydrogen is collected.	MQP2020–2
14.	"Iron alloys are better compared to pure iron" Justify.	MQP2020–2
15.	Observe the following chemical reactions. i) $Fe_2O_3 + 2AI \rightarrow 2Fe + Al_2O_3$ ii) $ZnO + C \rightarrow Zn + CO$ iii) $Zn + CO \rightarrow 2Fe + CO$ iv) $Al_2O_3 + 3C \rightarrow 2Al + 3CO$ Which of the above reaction is wrong? How is the metal present in the wrong equation extracted? Which of the above reaction can be used to join the broken parts of the machines? Why?	MQP2020–3
16.	Which physical properties are used in the following situations? i) Gold is used to make ornaments ii) Nickel is used in strings of guitar.	M2020 – 2
17.	Mention the difference between calcination and roasting. How these processes are used in the extraction of zinc? Explain with the help of chemical equations. After these processes is reduction necessary to obtain zinc? Why?	M2020 – 4
18.	What are amphoteric oxides?	S2020 – 1
19.	Draw the diagram of the apparatus used in refining of copper from copper sulphate solution. Label the following parts: i) Cathode ii) Anode mud.	S2020 – 2
20.	Observe the following chemical reactions Fe + CuSO4 → FeSO4 + Cu; Zn + FeSO4 → ZnSO4 + Fe The decreasing order of reactivity of metals in the above reactions is A. Zn > Fe > Cu B. Fe > Cu > Zn C. Zn > Cu > Fe D. Cu > Fe > Zn	MQP2021–MCQ
21.	The gas liberated when dilute sulphuric acid reacts with zinc granules A. Sulphur dioxide B. Carbon dioxide C. Nitrogen D. Hydrogen	MQP2021–MCQ
22.	When a copper is exposed to air for a long time it acquires a green coat. Because it reacts with A. sulphur B. nitrogen C. moist oxygen D. moist carbon dioxide	MQP2021–MCQ
23.	The amphoteric oxide among the following is A. sodium oxide B. zinc oxide C. calcium oxide D. potassium oxide	MQP2021–MCQ
24.	An alloy that made up of copper and tin is A. brass B. solder metal C. bronze D. stainless steel	MQP2021–MCQ
25.	When a carbon dioxide reacts with calcium hydroxide salts and water are produced. Then the nature of carbon dioxide is A. acidic B. metallic C. both acidic and basic D. basic	MQP2021–MCQ
26.	Observe the following chemical reactions: Fe + CuSO4 → FeSO4+ Cu Zn + FeSO4 → ZnSO4+ Fe The decreasing order of reactivity of the metals in the above reactions is (A) Zn > Fe > Cu (B) Fe > Cu > Zn (C) Zn > Cu > Fe (D) Cu > Fe > Zn	J2021–1
27.	The process used to convert sulphide ores of metals into their oxides is (A) calcination (B) roasting (C) reduction (D) electrolysis	J2021–1
28.	The stages followed during the extraction of zinc from zinc sulphide ore are respectively (A) Calcination, Reduction, Refining (B) Roasting, Calcination, Refining (C) Roasting, Reduction, Refining (D) Calcination, Oxidation, Refining	S2021–1

29.	Observe the following equations of chemical reactions : $Zn + FeSO_4 \rightarrow ZnSO_4 + Fe$ $2Al + 3ZnSO_4 \rightarrow Al_2(SO_4)_3 + 3\ Zn$ The increasing order of reactivity of the metals in the above reactions is (A) Fe < Zn < Al (B) Al < Zn < Fe (C) Zn < Fe < Al (D) Al < Fe < Zn	S2021–1
30.	The amphoteric oxide among the following is A) Potassium oxide B) Sodium oxide C) Calcium oxide D) Zinc oxide	MQP2022–MCQ
31.	Draw the diagram of arrangement of the apparatus to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts. i) zinc granules ii) soap solution	MQP2022–3
32.	a) Ionic compounds in solid state do not conduct electricity, but in molten state are good conductors of electricity. Why ? b) Write the formation of magnesium chloride (MgCl2) with the help of electron dot structure.	MQP2022–4
33.	Draw the diagram to show the arrangement of the apparatus used for testing the conductivity of salt solution and label 'graphite rod'.	A2022–2
34.	Give reason: a) Metals are used in making cooking vessels. b) Sodium metal is stored in kerosene. **OR** Give reason: a) When a calcium metal reacts with water, the liberated hydrogen gas does not catch fire. b) Ionic compounds have high melting and boiling points.	A2022–2
35.	Give reason. i) Ionic compounds have high melting and boiling points. ii) Ionic compounds in solid state do not conduct electricity.	MQP–2023–3
36.	Draw the diagram of the arrangement of apparatus to show the action of steam on metals. i) Metal piece ii) Delivery tube	MQP–2023–4
37.	Draw the diagram of arrangement of apparatus to show the action of steam on a metal.	A2023–2
38.	a) Depict the formation of magnesium chloride with the help of electron dot structure. b) Hydrogen gas is not liberated when a metal like zinc reacts with nitric acid. Why ? OR How are metals in the middle of the reactivity series extracted from their ores ? Explain.	A2023–2
39.	Ionic compounds have high melting point and boiling point. Why ?	J2023–1
40.	What are alloys ? Write the constituent elements present in bronze and solder metal. **OR** What are ores ? Name the respective methods used to convert sulphide and carbonate ores of metals into their oxides.	J2023–2
41.	Draw the diagram of arrangement of the apparatus used to show the action of steam on metal. Label the following parts : i) Metal sample ii) Delivery tube.	J2023–3

CHAPTER 04 – CARBON & ITS COMPOUNDS		
01.	What are saturated hydrocarbons and unsaturated hydrocarbons? Write the structure of the simplest hydrocarbon. **OR** Name the functional group in the following compounds and write their molecular formula. (i) Ethanol (ii) Ethanoic acid	MQP1 – 2
02.	(a) Explain substitution reaction with an example and chemical equation. (b) Explain the cleansing action of soap.	MQP1 – 4
03.	The functional groups present in propanol and propanal respectively are (A) — OH and — CHO (B) — OH and — COOH (C) — CHO and — COOH (D) — CHO and — CO	A2019 MCQ
04.	The electronic configuration of element X is 2, 8, 8, 1 and the electronic configuration of element Y is 2, 8, 7. Then the type of bond formed between these two elements is (A) covalent bond (B) hydrogen bond (C) metallic bond (D) ionic bond	A2019– MCQ
05.	What are structural isomers? Name the first member of alkanes that shows structural isomerism.	A2019–2
06.	(i) Write the differences between saturated and unsaturated hydrocarbons. (ii) Write the molecular formula and structural formula of an alkene having five carbon atoms. **OR** (i) Carbon atom does not form C 4 − anion and C 4 + cation. Why? (ii) How can ethanol be converted into ethanoic acid?	A2019–3
07.	What is a covalent bond?	J2019 – 1
08.	Name the first member of alkynes and write its molecular formula.	J2019 – 1
09.	Explain substitution reaction in hydrocarbons with an example. **OR** Explain the mechanism of cleaning action of soaps.	J2019 – 2
10.	The general formula of two specific groups of saturated and unsaturated hydrocarbons is CnH2n. Write the structures of the member of each group when n = 3.	J2019 – 2
11.	The group of compounds which are in homologous series is: A) CH_4, C_2H_4, C_2H_2 B) CH_4, CH_3OH, HCHO C) CH_4, C_2H_6, C_3H_8 D) C_2H_2, C_3H_6, C_4H_{10}	MQP2020– MCQ
12.	The molecular formula of three fatty acids A, B and C present in oil or fat is $C_{12}H_{29}COOH$, $C_{15}H_{29}COOH$ AND $C_{16}H_{29}COOH$. Which of these is derived from i) alkane ii) alkene iii) alkyne? Which of them becomes rancid earlier? How can we increase its shelf life?	MQP2020– 3
13.	If one hydrogen atom of propane is replaced by a ketone group, then the molecular formula of the compound obtained is A) C_4H_8O B) C_3H_8O C) $C_3H_6O_2$ D) $C_4H_{10}O$	MQP2020– MCQ
14.	What is esterification reaction?	MQP2020– 1
15.	An example for saturated hydrocarbon is: (A) C_2H_6 (B) C_3H_4 (C) C_2H_2 (D) C_2H_4	M2020 – MCQ
16.	The molecular formula of three carbon compounds which are in homologous series are C_2H_6 , C_3H_8 , C_4H_{10}. The suitable general formula for these compounds is (A) CnH2n (B) CnH2n−1 (C) CnH2n−2 (D) CnH2n+2.	M2020 – MCQ s
17.	Explain the cleansing action of soaps. **OR** Explain the method of converting ethanol into ethanoic acid with the help of chemical equation.	MQP2020– 2
18.	Explain the formation of covalent bond taking the example of methane and write the electron dot structure of methane.	MQP2020– 2

19.	Write the structural formula of butane and ethanoic acid.	MQP2020–2
20.	Explain the addition and substitution reaction with the help of examples. C_2H_6 undergoes substitution reaction but not addition reaction. Why? **OR** Explain how soap cleans clothes. More amount of soap is required to clean the clothes in hard water. Why?	M2020 – 3
21.	Identify the correct electron dot structure of nitrogen molecule in the following: (A) :N⋮⋮N: (B) :N⋮⋮N: (C) ·N⋮⋮N· (D) ·N⋮⋮N·	S2020 – MCQ
22.	The name and the molecular formula of the unsaturated hydrocarbon having general formula Cn H2n and containing 3 carbon atoms is: (A) propane, C_3H_8 (B) Cyclopropane, C_3H_6 (C) Propyne, C_3H_4 (D) Propene, C_3H_6	S2020 – MCQ
23.	Can detergent be used to test hardness of water? Give reason.	S2020 – 1
24.	a) What are structural isomers? Write two structures of butane molecule. b) How would you distinguish experimentally between an alcohol and a carboxylic acid?	S2020 – 4
25.	The correct group of saturated hydrocarbons is: A. CH4, C2H4, C3H4 B. C2H6, C3H8, C4H10 C. C2H2, C2H6, CH4 D. C2H2, C3H6, C4H6	MQP2021–MCQ
26.	The atomic number of an element 'X' is 11 and the atomic number of 'Y' is 17. Then the type of bond formed between these two elements A. hydrogen bond B. covalent bond C. ionic bond D. metallic bond	MQP2021–MCQ
27.	The functional group present in the carbon compound is:  A. aldehyde B. alcohol C. ketone D. carboxylic acid	MQP2021–MCQ
28.	The number of single bonds present in the structure of a cyclohexane molecule A. 12 B. 18 C. 24 D. 6	MQP2021–MCQ
29.	The molecular formula of benzene is A. C_5H_{12} B. C_6H_{12} C. C_6H_6 D. C_6H_{10}	MQP2021–MCQ
30.	The number of single bonds and double bonds present in a structure of benzene molecule respectively A. 6 and 6 B. 9 and 3 C. 7 and 5 D. 3 and 9	MQP2021–MCQ
31.	The common molecular formula for both cyclopropane and propene A. C_3H_6 B. C_3H_8 C. C_3H_4 D. C_2H_6	MQP2021–MCQ
32.	Carbon has the ability to form bonds with other atoms of carbon giving rise to large molecules. This unique property of carbon is A. saponification B. catenation C. hydrogenation D. esterification	MQP2021–MCQ
33.	The group of compounds which are in homologous series A. CH_4, C_2H_6, C_3H_8 B. CH_4, C_2H_4, C_2H_2 C. CH_4, CH_3-OH, H-CHO D. C_2H_2, C_3H_6, C_4H_{10}	MQP2021–MCQ
34.	The structural formula of propanal is:  	J2021–1

	(C)  (D) 	
35.	The number of single bonds and double bonds present in a structure of benzene molecule respectively (A) 3 and 9 (B) 9 and 3 (C) 6 and 6 (D) 7 and 5	J2021–1
36.	The common molecular formula of both hexene and cyclohexane is (A) C_6H_6 (B) C_6H_{14} (C) C_6H_{12} (D) C_6H_{10}	J2021–1
37.	The major component of bio-gas is (A) propane (B) butane (C) methane (D) ethane	S2021–1
38.	The pair of carbon compounds having same molecular formula is (A) Hexane, Hexene (B) Hexene, Hexyne (C) Hexene, Benzene (D) Hexene, Cyclohexane	S2021–1
39.	The functional group present in this carbon compound is  (A) Aldehyde (B) Ketone (C) Carboxylic acid (D) Alcohol	S2021–1
40.	A group of carbon compounds that are in homologous series (A) CH_4, C_2H_4, C_3H_4 (B) C_2H_2, C_2H_6, C_3H_6 (C) C_2H_4, C_3H_6, C_4H_8 (D) C_3H_6, C_3H_8, C_3H_4	S2021–1
41.	The saturated hydrocarbon among the following is (A) C_5H_8 (B) C_2H_2 (C) C_6H_6 (D) C_5H_{12}	S2021–1
42.	a) Write any two differences between saturated and unsaturated carbon compounds. b) Write the molecular formula and structural formula for the following carbon compounds. i) propanoic acid ii) cyclohexane ii) pentane	MQP2022–5
43.	Write the structural formula of ethene molecule.	A2022–1
44.	a) What are structural isomers ? Write the molecular and structural formula of butane. b) What is catenation ? Write general formula for alkenes.	A2022–4
45.	Mention the number of single bonds and double bonds present in the structure of C_2H_5COOH molecule.	MQP–2023–MCQ
46.	Write the electron dot structure of methane.	MQP–2023–1
47.	a) The conversion of ethanol to ethanoic acid is an oxidation reaction. Why? b) What are structural isomers? Write the structural isomers of butane.	MQP–2023–4
48.	The general formula of cycloalkanes is CnH2n and its first member is cyclopropane (C3H6). Write the molecular formula and structural arrangement of the fourth member of this homologous series.	A2023–4
49.	What is hydrogenation ?	A2023–1
50.	a) How will ethanol be oxidised ? b) Explain the cleaning action of soaps.	A2023–4
51.	Why are detergents more suitable for cleansing clothes in hard water ?	J2023–1
52.	In a homologous series, the first member of hydrocarbon group has the molecular formula CH4. Then find out the molecular formula of the fourth member and write two types of structural formula of it.	J2023–2
53.	a) Identify unsaturated hydrocarbons in the following carbon compounds and write their structural formula. C_6H_6, C_5H_{12}, C_2H_5OH, C_2H_2.	J2023–3

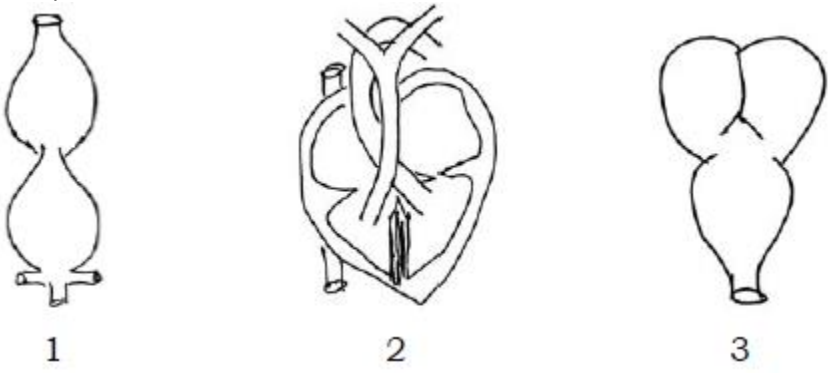
	b) Write the difference between esterification and saponification. **OR** a) Write electron dot structure of oxygen molecule. b) Carbon atom does not form C^{4-} anion and C^{4+} cation. Why ?	

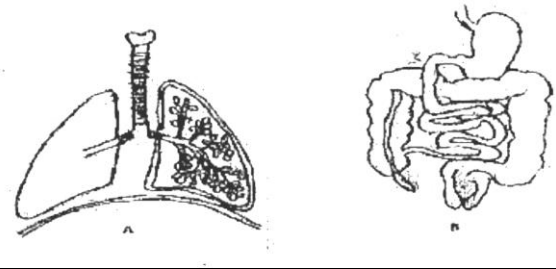
CHAPTER 05 – PERIODIC CLASSIFICATION OF ELEMENTS

01.	The atomic numbers of two elements A and B are 11 and 12 respectively. Which element exhibits highest metallic property? Why? Write the molecular formula of the compounds formed when these elements combine with the element 'Z' having atomic number 8.	MQP1 – 3
02.	Observe the given table and answer the following question. <table><tr><td>*Elements*</td><td>*A*</td><td>*B*</td><td>*C*</td><td>*D*</td><td>*E*</td></tr><tr><td>*Atomic number*</td><td>11</td><td>4</td><td>2</td><td>7</td><td>19</td></tr></table> Identify the two elements that belong to the same period and the two elements that belong to the same group. Give reason for your conclusion.	A2019–3
03.	The number of groups and periods in the modern periodic table respectively, are (A) 7 and 9 (B) 18 and 7 (C) 7 and 18 (D) 9 and 7.	J2019 – MCQ
04.	The position of elements A, B, C, D in the modern periodic table is given in the following table. Answer the following questions by observing the table: <table><tr><td></td><td>*Group 1*</td><td>*Group 2*</td></tr><tr><td>*Period 3*</td><td>*A*</td><td>*B*</td></tr><tr><td>*Period 4*</td><td>*C*</td><td>*D*</td></tr></table> (i) Which element has the highest atomic size? Why? (ii) Which element has the least metallic property? Why?	J2019 – 2
05.	How did Mendeleev arrange the elements? He left empty place in his periodic table. Why? Explain the limitations of Mendeleev classification.	MQP2020–4
06.	In the modem periodic table, 'A' and B' are two elements belonging to first and seventeenth group respectively and both of. them belong to the third period. Write their electronic configuration. Which of them is a metal? Why? Write the chemical formula of the compound obtained when these two elements react with each other. **OR** '$^{12}C_6$ and $^{14}C_6$ are two elements. Do both these elements get different positions in modem periodic table? Explain your answer. Identify the period and group to which they belong in the modern periodic table and explain your answer.	MQP2020–3
07.	Sodium and potassium are placed in the same group of modern periodic table. If the molecular formula of sodium sulphate is Na_2SO_4, then decide the molecular formula of potassium sulphate. Give reason for your answer.	M2020 – 1
08.	$CuO + H_2 \rightarrow Cu + H_2O$ In this reaction name the reactant i) that is oxidised ii) that is reduced.	M2020 – 1
09.	The atomic numbers of two elements are 8 and 16 respectively. Write the electronic configuration of these two elements. Do you keep these two elements in the same group of the modern periodic table? Justify your answer. Find out which of these two elements is more electronegative. Give reason for your answer.	M2020 – 3
10.	The atomic numbers of elements A, B, C and D are 3, 9, 4 and 8 respectively. Elements having metallic nature among these are: (A) B and D (B) A and B (C) A and C (D) B and C.	S2020 – MCQ
11.	How are the limitations of Mendeleev's periodic table rectified in the modern periodic table? **OR** How does the atomic size vary in groups and periods of the modern periodic table? Why?	S2020 – 2
12.	The atomic number of an element is 20. In the modern periodic table this element belongs to the period	MQP2021–MCQ

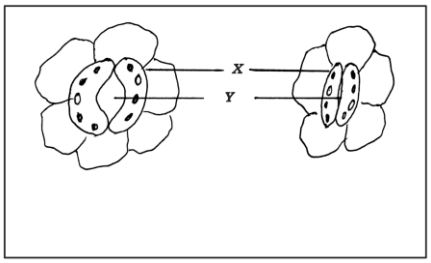
	A. 4 B. 8 C. 2 D. 3	
13.	In modern periodic table as we move down a group. The atomic size of the elements A. decreases B. does not change C. increases D. first increases and then decreases	MQP2021–MCQ
14.	"The three elements were written in the order of increasing atomic mass the atomic mass of middle element was roughly the average of the atomic masses of other two elements." This law was stated by A. Dobereiner B. Mendeleev C. Henry Moseley D. Newlands	MQP2021–MCQ
15.	The number of periods and groups in the modern periodic table respectively are A. 7 and 18 B. 7 and 9 C. 18 and 7 D. 9 and 7	MQP2021–MCQ
16.	"Properties of elements are a periodic function of their atomic number." This law was proposed by (A) Newlands (B) Mendeleev (C) Dobereiner (D) Henry Moseley	J2021–1
17.	The atomic number of an element is 20. In the modern periodic table, this element belongs to the period (A) 2 (B) 8 (C) 4 (D) 3	J2021–1
18.	"The properties of elements are the periodic functions of their atomic mass." This is (A) Dobereiner's law (B) Newlands' law (C) Mendeleev's law (D) Modern periodic law	S2021–1
19.	In modern periodic table, in moving from left to right along the period, the metallic property of the elements (A) increases (B) decreases (C) does not change (D) first decreases and then increases	S2021–1
20.	State Newlands' law of octaves.	MQP2022–1
21.	The atomic numbers of two elements are 12 and 16 respectively. Do you keep these two elements in the same period of the modern periodic table? Justify your answer. Which one of these two elements is more electropositive? Why?	MQP2022–3
22.	Atomic number of chlorine is 17. The period number of this element in modern periodic table is (A) 2 (B) 7 (C) 4 (D) 3.	A2022–1
23.	State modern periodic law.	A2022–1
24.	What is atomic size ? In the modern periodic table the atomic size decreases along a 'period' and increases down the 'group'. Why ? Explain.	A2022–3
25.	"Properties of elements are periodic function of their atomic number". This law was proposed by (A) Dobereiner (B) Mendeleev (C) Newlands (D) Henry Moseley	MQP–2023–MCQ
26.	The electronic configuration of four elements are given in the below table. Write the elements in the increasing order of their electropositivity and give reason. Elements: Na — 2, 8, 1; S — 2, 8, 6; Al — 2, 8, 3; K — 2, 8, 8, 1	MQP–2023–4

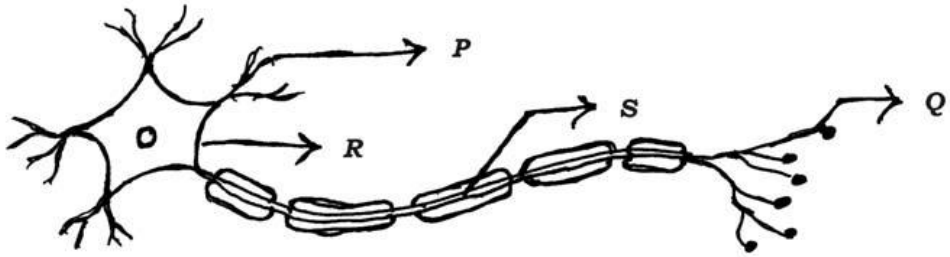
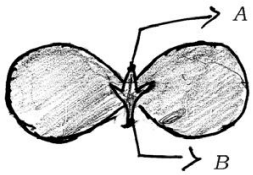
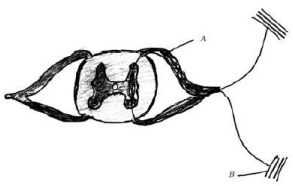
<table>
<tr><td>27.</td><td>Among $_{2}X^{4}$, $_{8}Y^{16}$, $_{10}Z^{20}$; the elements having zero valency are
[2, 8, 10 are atomic numbers of elements]
(A) $_{2}X^{4}$ and $_{8}Y^{16}$ (B) $_{8}Y^{16}$ and $_{10}Z^{20}$
(C) $_{2}X^{4}$ and $_{10}Z^{20}$ (D) $_{2}X^{4}$, $_{8}Y^{16}$ and $_{10}Z^{20}$</td><td>A2023–
MCQ</td></tr>
<tr><td>28.</td><td>a) Observe the given part of the modern periodic table and answer the following questions:
i) Which element is more electropositive ? Why ?
ii) Atoms of which element have minimum atomic radius ? Why ?
b) Mention the period and group number of the element that has atomic number 19.
<table><tr><th>Groups → / Periods ↓</th><th>1</th><th>2</th><th>13</th><th>17</th></tr><tr><td>2</td><td>—</td><td>Be</td><td>—</td><td>—</td></tr><tr><td>3</td><td>Na</td><td>Mg</td><td>Al</td><td>Cl</td></tr><tr><td>4</td><td>—</td><td>Ca</td><td>—</td><td>—</td></tr></table></td><td>A2023–3</td></tr>
<tr><td>29.</td><td>Mendeleev’s periodic table is constructed on the basis of
(A) Atomic number (B) Electronic configuration of an atom
(C) Atomic size (D) Atomic mass.</td><td>J2023–
MCQ</td></tr>
<tr><td>30.</td><td>The elements are arranged in the increasing order of their atomic masses in the below given table. Observe it and answer the following questions :
<table><tr><td>Sa</td><td>Re</td><td>Ga</td><td>Ma</td><td>Pa</td><td>Dha</td><td>Ni</td><td></td><td></td></tr><tr><td>H</td><td>Li</td><td>Be</td><td>B</td><td>C</td><td>N</td><td>O</td><td>F</td><td>Na</td></tr></table>i) Name the elements that belong to the same group.
ii) State the law that helps to group these elements.
iii) Write two limitations of the same law.</td><td>J2023–3</td></tr>
</table>

CHAPTER 06 – LIFE PROCESSES		
01.	In mammals and birds oxygenated blood and deoxygenated blood gets separated. Why?	MQP1 – 1
02.	Explain the breakdown of glucose in aerobic respiration and anaerobic respiration. **OR** Explain the process of transportation of substances in phloem.	MQP1 – 2
03.	Draw the diagram showing the structure of a nephron and label the following parts (i) Glomerulus (ii) Bowman's capsule	MQP1 – 2
04.	An event that may happen in heterotrophic nutrition is A) Conversion of carbon dioxide into carbohydrate B) Unused carbohydrates are stored in the form of starch C) Excess of glucose converts into glycogen. D) Water molecules decompose into hydrogen and oxygen molecules	MQP2 – MCQ
05.	Identify the correct statement among the following with respect to plant hormones. A) Cytokinin promotes wilting of leaves B) Auxin inhibits stem elongation C) Abscisic acid inhibits growth of plants D) Gibberellin promotes falling of leaves	MQP2020– MCQ
06.	Significant role of stomata in transportation is to A) create upward pressure B) absorb carbon dioxide C) release oxygen D) perform transpiration continuously	MQP2020– MCQ
07.	Under what condition lactic acid is produced in the muscle cells?	A2019–1
08.	Explain the process of translocation of food materials in plants. **OR** Explain the process of digestion in the small intestine of man.	A2019–2
09.	Draw the diagram showing the sectional view of the human heart. Label the following parts. (i) Aorta (ii) Chamber of the heart that receives deoxygenated blood.	A2019–3
10.	The correct statement related to digestion in small intestine is (A) acidic food is made alkaline by bile juice (B) food is made acidic by hydrochloric acid (C) starch is digested due to the action of amylase (D) protein is digested due to the action of pepsin.	J2019 – MCQ
11.	Name the products of anaerobic respiration.	J2019 – 1
12.	Draw the diagram showing opened stomata. Label the following parts: (i) Guard cells (ii) Stomatal pore.	J2019 – 2
13.	Diagrams given below represent hearts of three different animals. Observe it and answer the question.  1 2 3 Among these, which heart is helpful to the animals that require more energy? Why? **OR** The approximate lengths of small intestine of animals x and y are given in the table. Observe it and answer the question.	J2019 – 2

	<table><tr><th>*Animals*</th><th>*Approximate length of small intestine*</th></tr><tr><td>*x*</td><td>20 to 40 feet</td></tr><tr><td>*y*</td><td>5 to 8 feet</td></tr></table> Identify the herbivorous and carnivorous animals in the table and support your decision with scientific reasons.	
14.	"The rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms." Why?	M2020 – MCQ
15.	What are the methods used by plants to get rid of excretory products? OR Mention the importance of transpiration in plants.	MQP2020–2
16.	Draw the diagram showing the structure of human alimentary canal and label the following parts. a) the part which stores bile juice. b) the longest part of the alimentary canal.	MQP2020–4
17.	What similarity is observed in the structures of 'A' and 'B' with respect to their function? 	MQP2020–1
18.	Write the events occurring during photosynthesis.	MQP2020–2
19.	How is the end product of nutrition glucose breaks down among all the organisms under the conditions given below? i) In the presence of atmospheric oxygen ii) In the absence of atmospheric oxygen iii) In muscle cells due to lack of oxygen **OR** Explain the methods of i) Oxygen supply to the cells ii) Release of carbon dioxide to the atmosphere from the cells during the process of transportation in humans.	MQP2020–3
20.	Draw the diagram showing longitudinal section of human brain and label the following parts. i) Part of hind brain that controls involuntary functions ii) The part that interprets sensory information	MQP2020–3
21.	Draw the diagram showing the germination of pollen on stigma and label the pollen tube.	M2020 - 2
22.	Draw the diagram showing the schematic sectional view of the human heart. Label the following parts i) Aorta ii) Pulmonary veins.	M2020 – 3
23.	The site of complete digestion of carbohydrates, proteins and fats is (A) stomach (B) large intestine (C) small intestine (D) liver.	S2020 – MCQ
24.	Eating chapati by chewing it very slowly tastes sweeter. Why?	S2020 – 2
25.	How are the functions of arteries, veins and capillaries are interrelated in the circulation of blood? **OR** How does transportation of water take place over the heights in a plant?	S2020 – 3

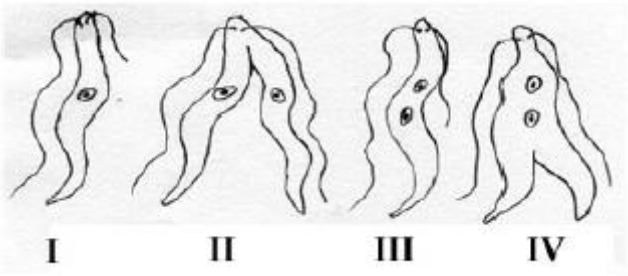
26.	The process that helps in the absorption of upward movement of water and minerals dissolved in it from roots to the leaves in plants A. Respiration B. Transpiration C. Photosynthesis D. Translocation	MQP2021–MCQ
27.	The correct pathway of oxygenated blood coming from lungs to the heart in the human body A. Pulmonary arteries → Right ventricle → Right atrium B. Pulmonary arteries → Right atrium → Right ventricle C. Pulmonary veins → Left ventricle → Left atrium D. Pulmonary veins → Left atrium → Left ventricle	MQP2021–MCQ
28.	The blood vessels that carry blood from all parts of the human body to the heart are A. Arteries B. Capillaries C. Veins D. Pulmonary arteries	MQP2021–MCQ
29.	The plants can get rid of excess of water by this process A. Photosynthesis B. Transpiration C. Respiration D. Translocation	MQP2021–MCQ
30.	The correct path of urine flow in the human excretory system A. kidney -->ureter--> urethra -->urinary bladder B. kidney -->urinary bladder -->urethra ureter C. kidney -->ureter -->urinary bladder -->urethra D. urinary bladder -->kidney -->ureter -->urethra	MQP2021–MCQ
31.	The blood vessels that carry blood from all parts of the human body to the heart are (A) arteries (B) capillaries (C) pulmonary arteries (D) veins	J2021–1
32.	Plants can get rid of excess of water by this process (A) Transpiration (B) Photosynthesis (C) Respiration (D) Translocation	J2021–1
33.	The blood vessels that carry deoxygenated blood from the heart to the lungs in the human body are (A) Pulmonary veins (B) Aorta (C) Veins (D) Pulmonary arteries	S2021–1
34.	The transport of soluble products of photosynthesis in plants is (A) Transpiration (B) Osmosis (C) Diffusion (D) Translocation	S2021–1
35.	The site of complete digestion of carbohydrates, proteins and fats is A) large intestine B) stomach C) liver D) small intestine	MQP2022–MCQ
36.	Draw the diagram showing the structure of nephron and label bowman's capsule.	MQP2022–2
37.	Write the flowchart to show the breakdown of glucose by various pathways in the cytoplasm of living organisms. **OR** Explain the function of stomach in the human digestive system.	MQP2022–3
38.	Draw the diagram showing structure of human brain. Label the following parts -i) cerebrum ii) cerebellum	MQP2022–4
39.	Give reason : a) 'Ventricles of the human heart have thick wall.' b) 'It is necessary to separate oxygenated and deoxygenated blood in mammals and birds.'	A2022–2
40.	Draw the diagram showing the structure of human excretory system and label 'urinary bladder'.	A2022–2
41.	Which molecule is formed during the first step of cellular respiration by the breakdown of glucose molecule in cytoplasm ? Mention the types of respiration and write any two differences between them. **OR** Which are the factors essential for photosynthesis ? Mention the events that occur during this process and represent this process by balanced chemical equation.	A2022–4
42.	Draw the diagram showing the structure of the human brain and label the following parts i) Cerebrum ii) Cerebellum.	A2022–4

43.	a) What is the important function of 'villi' and 'alveoli' in our body? b) Explain the structure and function of nephron. OR a) What is the importance of transpiration in plants? b) How does translocation of materials take place by phloem tissue?	MQP–2023–4
44.	Observe the given below figures:  a) Which figure indicates the massive amount of exchange of gases ? Why ? b) Name the parts X and Y. What is the function of other part X ?	A2023–2
45.	Explain the digestion of food materials in stomach and small intestine. OR Explain the role of xylem and phloem tissues in the transportation of materials in plants.	A2023–4
46.	a) As the growth advances in a climbing plant (creeper) that appears as the plant is moving towards a particular direction. How ? b) Explain the necessity of chemical communication in animals.	J2023–4
47.	a) Compare the functions of xylem tissue with that of phloem tissue. b) Explain the process of exchange of gases that take place through stomata in plants. OR a) How is the structure of human heart supportive in transporting oxygenated blood and deoxygenated blood ? Explain. b) In humans, how is the digested food absorbed by the blood ? Mention the function of blood in transporting necessary materials.	J2023–4

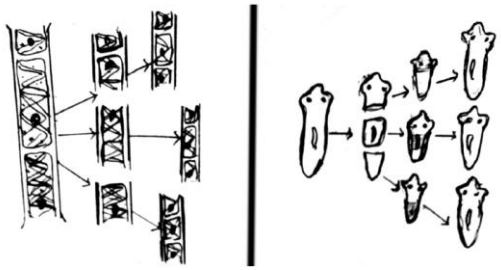
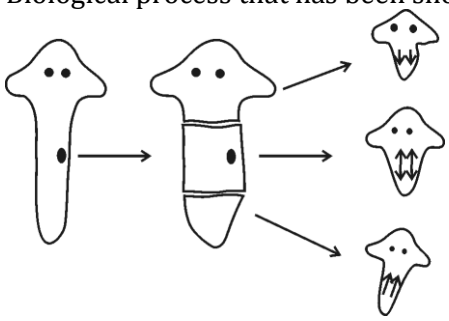
CHAPTER 07 – CONTROL & CO–ORDINATION		
01.	What is geotropism?	MQP1 – 1
02.	The correct path of the movement of nerve impulses in the following diagram is  (A) Q → S → R → P (B) P → Q → R → S (C) S → R → Q → P (D) P → R → S → Q	A2019–1
03.	Draw the diagram showing the structure of neuron. Label the following parts: (i) The part which has prominent nucleus (ii) Dendrite	J2019 – 2
04.	Imagine the following situations: (i) Clapping at the end of a programme (ii) Fluctuating blood pressure in the body. How these situations are functionally different? Give reason. **OR** "We withdraw our leg when stepped on thorn unknowingly." (a) Trace the sequences of events which occur in this action. (b) Which part of human nervous system controls this action?	J2019 – 3
05.	How does the nervous system differ from the endocrine system in forming control and co–ordination in animals?	MQP2020–2
06.	Write the functions of forebrain, medulla and cerebellum in human brain.	MQP2020–2
07.	Draw the diagram showing the structure of human excretory system and label the part that collects urine.	MQP2020–2
08.	In the given figure of Cotyledon the parts labelled as A and B respectively are:  (A) fruit, shoot (B) primary shoot, primary root (C) secondary root, primary shoot (D) bud, leaf.	M2020 – MCQ
09.	The incorrect statement related to thyroxine hormone among the following is: (A) it regulates fat metabolism (B) its deficiency leads to goitre (C) it is secreted by parathyroid gland (D) iodine in the food is essential for its production.	M2020 – MCQ
10.	A response that does not happen in plants due to their growth is A) Bending of shoot towards light B) Penetration of roots in deep soil C) Folding of leaves when touched D) Climbing tendrils of a creeper	MQP2020–MCQ
11.	What is the role of auxin hormone to bring control and coordination in the growth of plants?	MQP2020–2
12.	Name the given structure. What is its general function? Mention the function of the parts labelled as A and B. These structures in animals are said to be efficient ways to give quick responses. Why? 	M2020 – 4

13.	A person's face has become pale and his breathing rate has increased due to fear. Analyse the process which enables the person to deal with this situation.	S2020 – 2
14.	Draw the diagram showing longitudinal section of human brain. Label the following parts a) Mid brain b) Gland which stimulates growth in all organs.	S2020 – 4
15.	The hormone that regulates carbohydrate, protein and fat metabolism in the human body is A. Testosterone B. Adrenaline C. Thyroxin D. Insulin	MQP2021–MCQ
16.	The mismatched pair among the following A. Adrenaline → Pituitary gland B. Testosterone → Testes C. Insulin → Pancreas D. Thyroxin → Thyroid gland	MQP2021–MCQ
17.	The part of human brain responsible for precision of voluntary actions and maintaining the posture and balance of the body A. pons B. cerebrum C. hypothalamus D. cerebellum	MQP2021–MCQ
18.	The main function of abscisic acid (hormone) in plants is to A. increase the length of cells B. inhibits the growth of plants C. promote cell division D. promote the growth of stem	MQP2021–MCQ
19.	The growth of pollen tubes towards ovules in the flower of plants A. Chemotropism B. Phototropism C. Geotropism D. Hydrotropism	MQP2021–MCQ
20.	The part of human brain that controls the involuntary actions like salivation and blood pressure is A. pons B. medulla C. cerebrum D. cerebellum	MQP2021–MCQ
21.	The hormone that regulates carbohydrate, protein and fat metabolism in the human body is (A) Testosterone (B) Adrenaline (C) Insulin (D) Thyroxin	J2021–1
22.	A pot that has growing seedling is kept in a dark room. A burning candle is placed near it for a few days. The top part of the seedling bends towards the light of burning candle. This is (A) Chemotropism (B) Phototropism (C) Geotropism (D) Hydrotropism	J2021–1
23.	The gap between two neurons is (A) dendrite (B) axon (C) synapse (D) cell body	J2021–1
24.	A plant hormone that inhibits the growth of plants is (A) Auxin (B) Gibberellin (C) Cytokinin (D) Abscisic acid	S2021–1
25.	The centre of reflex action is (A) Cerebrum (B) Spinal cord (C) Cerebellum (D) Hypothalamus	S2021–1
26.	The correct path of movement of electrical impulse in a neuron is (A) Dendrite → Cell body → Axon → Axon end (B) Axon → Axon end → Dendrite → Cell body (C) Dendrite → Axon →Cell body → Axon end (D) Cell body → Dendrite → Axon end → Axon	S2021–1
27.	The plant hormone that causes wilting of leaves is A) cytokinin B) auxin C) abscisic acid D) gibberellin	MQP2022–MCQ
28.	The folding up of leaves of a sensitive plant (touch me not plant) on touching with a finger is not a tropism. Why ?	MQP2022–1
29.	Mention the function of the following plant hormones – i) Auxin ii) Cytokinin.	A2022–2
30.	Define the following related to movement due to growth in plants : i) Phototropism ii) Geotropism.	A2022–2
31.	How phototropism, thigmotropism and chemotropism are co-ordinated in the apparent movement of creepers (climbing-up plants) towards particular direction?	MQP–2023–3
32.	Draw the diagram showing the structure of the human brain. Label the following parts. i) Cerebrum ii) Cerebellum	MQP–2023–3
33.	"A person immediately starts running soon after observing a snake." The correct transmission path of reflex impulse in this situation is	A2023–MCQ

	(A) Receptor → Sensory neuron → Brain → Relay neuron → Motor neuron → Effector (B) Receptor → Sensory neuron → Spinal cord → Relay neuron → Motor neuron → Effector (C) Effector → Spinal cord → Sensory neuron → Relay neuron → Motor neuron → Receptor (D) Effector → Motor neuron → Relay neuron → Brain → Sensory neuron → Receptor	
34.	What is the role of abscisic acid in plants ?	A2023–2
35.	Draw the diagram showing the structure of human brain. Label the following parts : i) Hypothalamus ii) Pons.	A2023–4
36.	Draw the diagram showing the structure of nephron and label 'glomerulus'.	J2023–4
37.	Draw the diagram showing the structure of human brain and label the following parts : i) Mid-brain ii) Pons	J2023–3

CHAPTER 08 – HOW DO ORGANISMS REPRODUCE?		
01.	The correct order of binary fission in Leishmania is  (A) II, III, IV, I (B) I, III, IV, II (C) IV, I, III, II (D) III, I, II, IV	MQP1
02.	Draw the diagram showing the germination of pollen on stigma and label the following parts. (i) Stigma (ii) Pollen Tube	MQP1 – 2
03.	What is placenta? Write two functions of placenta.	MQP1 – 2
04.	A multicellular organism that shows the development of tiny individuals on one side of mother's body is A) Hydra B) Yeast C) Planaria D) Spirogyra	MQP2 – MCQ
05.	Part of the flower that develops into fruit and part of the seed that develops into root respectively are (A) ovary and plumule (B) plumule and radicle (C) ovary and radicle (D) ovary and ovule	A2019 MCQ
06.	Draw the diagram showing the longitudinal section of a flower. Label the following parts (i) Style (ii) Anther.	A2019–2
07.	The group of organisms that reproduce through fission only is (A) Amoeba, Hydra, Spirogyra (B) Leishmania, Amoeba, Yeast (C) Amoeba, Plasmodium, Planaria (D) Plasmodium, Amoeba, Leishmania.	J2019 – MCQ
08.	In sustaining reproductive fertility of a person, (a) position of the testis in the body (b) secretion of the testosterone (c) secretion of the prostrate gland are supplementary to each other. Explain scientifically.	J2019 – 2
09.	Draw the diagram showing the germination of pollen on stigma and label the part on which pollination takes place.	J2019 – 2
10.	Among the flowers A and B, which flower undergoes self pollination? Why?  	MQP2020–1
11.	A tall plant with red flowers (TtRr) is self pollinated. Represent the plants obtained in F2 generation with the help of a checker board (Punnet square). The traits which are not found in the parental plants are expressed in the off springs. Why?	MQP2020–3
12.	a) Explain why variations are observed in the off–springs formed by sexual reproduction. b) What are the advantages of vegetative propagation? **OR** a) Write the structure and function of placenta. b) What are the changes that occur in a flower after fertilization.	MQP2020–4
13.	Draw the diagram showing longitudinal section of a flower and label the part where pollination takes place.	MQP2020–2

14.	How are general growth and sexual maturation different from each other? Which are the symptoms observed in sexually matured females? When a matured female receives male sex cells due to sexual contact what changes will happen in her uterus?	MQP2020–5
15.	Explain the significant function of each structure in human male reproductive system. **OR** Explain the structure and important role of placenta during gestation period of woman.	M2020 – 3
16.	The type of reproduction found in Spirogyra is (A) Budding (B) Fragmentation (C) Vegetative reproduction (D) Spore formation.	S2020 – MCQ
17.	a) How does menstruation occur? b) How the process of budding in hydra is different from Bryophyllum? **OR** a) Explain the development of fertilized egg into a foetus in a woman. b) In humans, how the surgical contraceptive methods can be used to prevent pregnancy?	S2020 – 4
18.	A pathogen that causes gonorrhoea and syphilis transmitted through sexual contact: A. Protozoa B. Bacteria C. Virus D. Fungus	MQP2021–MCQ
19.	The correct sequence found in the process of sexual reproduction in flower is A. pollination, fertilization, embryo, seed B. seed, embryo, fertilization, pollination C. embryo, seed, pollination, fertilization D. pollination, fertilization, seed, embryo	MQP2021–MCQ
20.	The part of the plant seed that grows and develops into root on germination A. Cotyledon B. Endosperm C. Radicle D. Seed Coat	MQP2021–MCQ
21.	A common part among the following that is found in reproductive system of both in flowering plants and humans is A. Vas deferens B. Anther C. Ovary D. Style	MQP2021–MCQ
22.	Which of the following is not a part of human female reproductive system? A. Ovary B. Uterus C. Vas deferens D. Fallopian tube	MQP2021–MCQ
23.	The correct sequence found in the process of sexual reproduction in a flower is (A) pollination, fertilization, seed, embryo (B) seed, embryo, fertilization, pollination (C) embryo, seed, pollination, fertilization (D) pollination, fertilization, embryo, seed	J2021–1
24.	The embryo gets nutrition from the mother's blood with the help of a special part called (A) Fallopian tube (B) Ovary (C) Uterus (D) Placenta	J2021–1
25.	The common passage for both sperms and urine in human male reproductive system is (A) Urethra (B) Ureter (C) Vas deferens (D) Urinary bladder	J2021–1
26.	The parts that develop into fruit and seed in a flower respectively are (A) stamen and ovary (B) ovule and ovary (C) ovary and ovule (D) stamen and ovule	S2021–1
27.	In the human female reproductive system, the egg is carried from ovary to the uterus through this part (A) cervix (B) fallopian tube (C) placenta (D) vagina	S2021–1
28.	A common bacterial infection that spreads through sexual contact in human beings is (A) Gonorrhoea (B) AIDS (C) Hepatitis-B (D) Warts	S2021–1
29.	The correct sequence of reproductive stages occur in flowering plants is A) gametes, zygote, embryo, seed. B) zygote, gametes, embryo, seed. C) seed, embryo, zygote, gametes. D) gametes, embryo, zygote, seed.	MQP2022–MCQ
30.	The unfertilized egg of human female contains A) One 'Y' Chromosome B) One 'X' Chromosome C) 'XX' Chromosomes D) 'X' and 'Y' Chromosomes	MQP2022–MCQ

31.	What are analogous organs ?	MQP2022–1
32.	Explain the human male reproductive system.	MQP2022–3
33.	In humans, sexually transmitted viral infection is (A) AIDS (B) Syphilis (C) Tuberculosis (D) Gonorrhoea.	A2022–1
34.	In males, testes are located outside the abdominal cavity in scrotum. Why ?	A2022–1
35.	Draw the diagram showing the longitudinal section of a flower and label 'ovary'.	A2022–2
36.	What is the function of ovary and fallopian tube in human female reproductive system ?	A2022–2
37.	The reproduction methods expressed in both of the above figures are similar or different from each other? Write the justification to your answer.  SPIROGYRA PLANARIA	MQP–2023–2
38.	In humans, the testes are located outside the lower abdomen in the scrotum because (A) to protect testes from mechanical shocks (B) to increase the production of sperms (C) to maintain the secretion of testosterone hormone (D) to maintain the temperature required for sperm production.	A2023–MCQ
39.	Write two examples for the organisms that reproduce by binary fission.	A2023–2
40.	What is pollination ? What are the changes that occur in the flower after pollination ?	A2023–3
41.	Biological process that has been shown in the diagram is:  (A) production of progenies by fragmentation method (B) production of progenies by multiple fission method (C) regeneration of tissues by development in specialised cells (D) asexual reproduction by vegetative propagation.	J2023–MCQ
42.	"Reaching to sexual maturation is an essential event with respect to mammals like humans." Substantiate this statement.	J2023–3

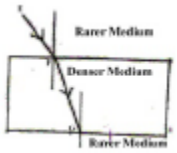
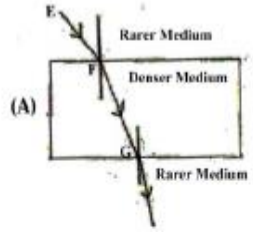
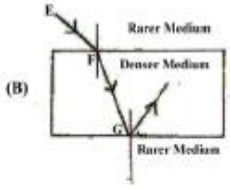
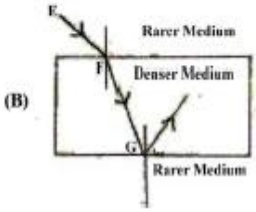
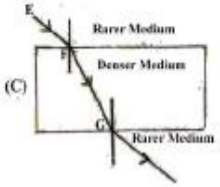
CHAPTER 09 – HEREDITY & EVOLUTION

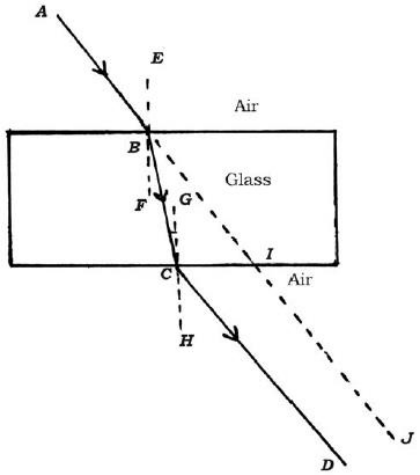
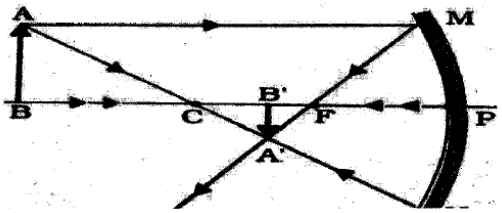
01.	Identify the correct pair of analogous organs among the following (A) The forelimb of man and the forelimb of a frog (B) The wing of a butterfly and the wing of a bat (C) The wing of a bird and the wing of a bat (D) The forelimb of lizard and the forelimb of a frog	MQP1
02.	What are fossils?	MQP1 – 1
03.	(a) Explain the process of sex determination in human beings (b) Why are the small number of surviving tigers a cause of worry from the point of view of genetics? **OR** (a) Traits acquired during the life time of an individual are not inherited. Why? (b) How do Mendel's experiments show that the traits are inherited independently? Explain.	MQP1 – 4
04.	A pure dominant pea plant producing round — yellow seeds is crossed with pure recessive pea plant producing wrinkled — green seeds. The number of plants bearing round — green seeds in the F1 generation of Mendel's experiment is (A) 0 (B) 1 (C) 3 (D) 9	A2019–MCQ
05.	What are fossils?	A2019–1
06.	Growth of thread like structures along with the gradual spoilage of tomato can be observed when a cut tomato is kept aside for four days. Interpret the causes for this change	A2019–3
07.	(i) Write the differences between homologous organs and analogous organs. (ii) Write the differences between the sex chromosomes of man and sex chromosomes of woman. (iii) Sex of a child is determined by the father. How?	A2019–4
08.	Observe the table which shows contrast forms of pea plants? Colour of the seed Position of the flower *Colour of the seed* / *Position of the flower* Green (*G*) / Axial (*A*) Yellow (*g*) / Terminal (*a*) The genetic makeup with green seed and terminal flowers is indicated as (A) gGAa (B) GgAa (C) GgAA (D) Ggaa.	J2019 – MCQ
09.	(i) How does relative method help to determine the age of fossils? (ii) "Experiences of an individual during its life time cannot direct evolution." Why? (iii) "Chromosomes inherited from the father determines the sex of a child." Explain.	J2019 – 4
10.	"Method of artificial selection is also a reason for the evolution of new species of organisms". Substantiate this statement with the help of an example.	MQP2020–3
11.	Two black female mice are crossed with a brown male. Later female I produced 9 black and 7 brown off springs, female II produced 57 black off springs. Then ij What inference can you make concerning inheritance of black and brown coloured mice? ii) With the help of phenotype given, find out what are the genotypes of parents?	MQP2020–4
12.	The gene for brown coloured hair is recessive that of gene for black coloured hair. What is the hair colour of a person who has inherited a gene for brown coloured hair from mother and black coloured hair from father?	M2020 – 1
13.	The plant bearing round yellow coloured (RrYy) seed are self pollinated with the same plant. Represent the result obtained in the F2 generation of dihybrid cross with the help of a checker board. Mention the varieties of plants obtained in F2 generation. **OR** What is evolution? Explain the three evidences for evolution.	M2020 – 4
14.	Explain the two methods to estimate the age of fossils.	S2020 – 2

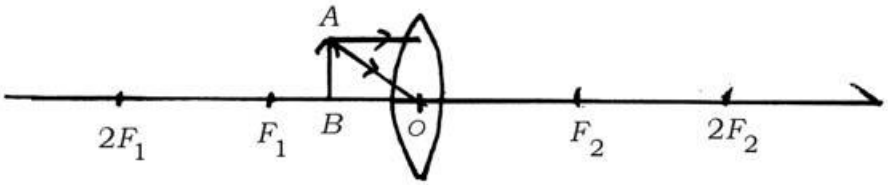
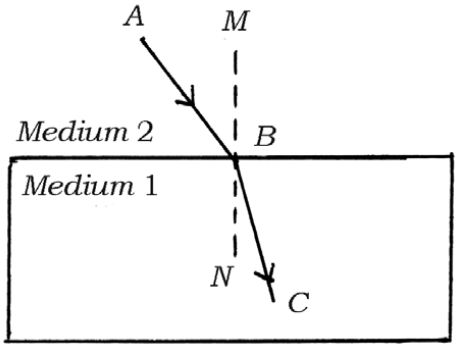
15.	Mendel crossed plants bearing red flowers (RR) with the plants bearing white flowers (rr) and produced progeny from them. The plants with red flowers obtained in F1 generation were different from the plants with red flowers of parental generation. Why? Explain with reasons.	S2020 – 3
16.	If a round green seeded pea plant (RRyy) is crossed with wrinkled yellow seeded pea plant (rrYY). The seeds produced in F1 generation are A. Round and green B. Wrinkled and yellow C. Wrinkled and green D. Round and yellow	MQP2021–MCQ
17.	The experiences of an individual during its life time cannot be passed on to its progony, because they are A. inherited traits B. acquired traits C. dominant traits D. recessive traits	MQP2021–MCQ
18.	Analogous organs have A. Same structure and same function B. Same structure and different functions C. Different structures and same function D. Different structures and different functions	MQP2021–MCQ
19.	Which of the following is an inherited trait? A. Reduction in the weight of an organism due to starvation B. Removal of tail in mice by surgery C. Development of muscles in athletes D. Type of earlobe	MQP2021–MCQ
20.	A pure tall pea plant (TT) is crossed with a short pea plant (tt). The ratio of pure tall pea plant to the short pea plants produced in F2 generation is: A. 3 : 1 B. 1 : 1 C. 1 : 3 D. 2 : 1	MQP2021–MCQ
21.	The wings of bat and pigeon are the examples of A. Analogous organs B. Vestigial organs C. Homologous organs D. Adaptive organs	MQP2021–MCQ
22.	The wings of bat and pigeon are the examples of A. Analogous organs B. Vestigial organs C. Homologous organs D. Adaptive organs	MQP2021–MCQ
23.	If a round green seeded pea plant [*RRyy*] is crossed with wrinkled yellow seeded pea plant [*rrYY*], the seeds produced in *F1* generation are (A) round and green seeds (B) wrinkled and yellow seeds (C) round and yellow seeds (D) wrinkled and green seeds	J2021–1
24.	Homologous organs (A) have same structure and perform same function (B) have same structure and perform different functions (C) have different structures and perform same function (D) have different structures and perform different functions	J2021–1
25.	The experiences of an individual during its lifetime cannot be passed on to its progeny because, they are (A) inherited traits (B) acquired traits (C) dominant traits (D) recessive traits	J2021–1
26.	Tall pea plants having round seeds (*TTRR*) are crossed with dwarf pea plants having wrinkled seeds (*ttrr*). The progeny obtained in F1 generation is (A) Tall plants having wrinkled seeds (B) Tall plants having round seeds (C) Dwarf plants having round seeds (D) Dwarf plants having wrinkled seeds	S2021–1
27.	Analogous organs have (A) same structure and perform same function (B) different structures and perform different functions (C) different structures and perform same function (D) same structure and perform different functions	S2021–1
28.	The genotypic ratio of F2 generation of Mendel's monohybrid cross experiment is (A) 3 : 1 (B) 2 : 1 (C) 1 : 2 : 1 (D) 9 : 3 : 3 : 1	S2021–1

29.	Why are traits acquired during its lifetime of an individual not inherited?	MQP2022–1
30.	The tall pea plant bearing red colour flowers (TTRR) is crossed with dwarf pea plant bearing white flowers (ttrr). Represents the result obtained in F2 generation of dihybrid cross with the help of checker board. Mention the ratio of different plants obtained in F2 generation. **OR** What is Speciation? Mention the factors could lead to the rise of a new species.	MQP2022–3
31.	What is dihybrid cross ? Write the ratio of the plants obtained in the F2 generation in Mendel's dihybridisation experiment.	A2022–2
32.	When a tall (TT) pea plant is crossed with a dwarf (tt) pea plant, represent the result obtained in F2 generation of monohybrid cross with the help of checker board and mention the ratio of varieties of plants.	A2022–3
33.	a) Mention any four main factors that lead to the rise of new species. b) The experiences of an individual acquired during its lifetime cannot be passed on to its progeny. Give reason. **OR** What are fossils ? Mention the methods of estimation of dating fossils and explain briefly	A2022–3
34.	AIDS : Virus : : Warts : _____ (A) Bacteria (B) Fungus (C) Protozoan (D) Virus	MQP–2023–MCQ
35.	a) How is the vegetative propagation in plants useful to the field of agriculture? b) Consistency of the DNA copying is important during reproduction. Why? OR a) How do germ cells receive half the amount of DNA? What is the need of this process? b) How does menstruation in women occur?	MQP–2023–3
36.	a) Tall pea plant (TT) is crossed with short pea plant (tt). What type of the plants will obtain in F1 generation? Write the genetic make up of this progeny. b) Forelimbs of frog, wings of bird, wings of bat, forelimbs of lizard pair them as analogous and homologous organs. Give reason for your pairing.	MQP–2023–5
37.	Mention the tools used for tracing the evolutionary relationships between the organisms.	A2023–3
38.	Tall pea plant producing red flowers (TT RR) is crossed with short pea plant producing white flowers (tt rr). i) Mention the type of plants produced from these plants in the F1 generation. ii) Write the ratio of plants obtained in the F2 generation by crossing the plants of F1 generation and name the varieties of plants obtained. OR Analyse the situations given below. Answer the questions given : Situation 1 : The number of green grasshoppers in a green zone has been increasing from one generation to another generation. Situation 2 : The number of brown grasshoppers in the same green zone has been reducing. Here, a) Where could genetic drift be happened more ? Why ? b) How can natural selection be considered as an important factor in organic evolution ?	A2023–3
39.	Student *'A'* tells to Student *'B'* that the wing of bird and arm of human are analogous organs. Student *'B'* replies both of them are homologous organs. Whose answer is correct ? Justify your answer with suitable reasons.	J2023–3
40.	Round, green colour seeds producing pea plant (RR yy) are crossed with wrinkled, yellow colour seeds producing pea plant (rr YY). Show the result of F2 generation with the help of a checker board and mention the ratio of varieties of plants. OR	J2023–3

	How are the traits of organisms classified as ‘dominant’ and ‘recessive’ traits ? The experiences of an individual acquired during its life-time cannot be passed on to its progeny. Why ?	

CHAPTER 10 – LIGHT – REFLECTION & REFRACTION		
01.	Observe the figure. The correct figure indicating the direction of the light ray FG after refraction is:      	MQP1
02.	The object distance of a lens is $-30cm$ and image distance is −10cm. Find the magnification of the lens. With the help of this, decide whether the size of the image is smaller or bigger than the size of the object.	MQP1 – 1
03.	Draw the ray diagram showing the formation of image when the object is kept beyond centre of curvature (C) of a concave mirror.	MQP1 – 2
04.	State the laws of refraction. What is the meaning of "the refractive index of crown glass is 1.52"? **OR** Define the power of a lens. What is the meaning of "The power of a lens is 1 diaptor". If the power of a lens is -2.0 D, then what type of lens is that? When an object is kept at infinity from this type of lens, what is the size of the image formed?	MQP1 – 3
05.	One of the effects of refraction among the following is A) Formation of image in a mirror B) Appearance of flowers in different colours C) The sky appears blue in colour D) The pencil immersed in water appears to be bent	MQP2 – MCQ
06.	To obtain a diminished image of an object from a concave mirror, position of the object should be (P = principal focus, C = centre of curvature, P = pole) (A) between C and F (B) beyond C (C) between P and F (D) at F	A2019 MCQ
07.	Convex mirror is commonly used as rear–view mirror in vehicles. Why?	A2019–1
08.	The focal length of a concave lens is 30 cm. At what distance should the object be placed from the lens so that it forms an image at 20 cm from the lens?	A2019–2
09.	Draw the ray diagrams for the image formation in a convex lens when an object is placed (i) at focus F1 (ii) beyond 2F1.	A2019–3
10.	Identify the emergent ray in the given figure.	J2019 – MCQ

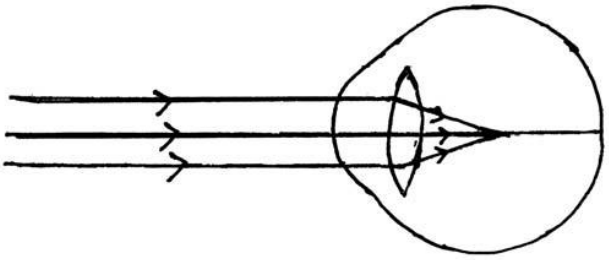
	 (A) CD (B) BC (C) AB (D) IJ.	
11.	What is the centre of curvature of a spherical mirror?	J2019 – 1
12.	Draw the ray diagram to show the formation of image by a convex lens when the object is at 2F1. [F1:Principal focus]	J2019 – 2
13.	A concave lens has focal length 30 cm. At what distance should the object be placed from the lens so that it forms an image at 20 cm from the lens? Also, find the magnification produced by the lens.	J2019 – 3
14.	Observe the following figure. Ab is light ray travelling from liquid to air. BC and BD are refracted rays. i) which is the refracted ray if the liquid taken is benzene? ii) which is the refracted ray if the liquid taken in water? Justify your answer. (The absolute refractive index of water and benzene are 1.33 and 1.5 respectively) OR An object 2cm tall is kept on the principal axis of a converging lens of focal length 8cm. Find the position, nature and size of the image formed if the object is at 12cm from the lens. Also find the magnification produced by the lens.	MQP2020–3
15.	Observe the figure. The image formed in the figure is:  A) Real, inverted, diminished B) Virtual, erect, diminished C) Virtual, erect, enlarged D) Real, inverted, enlarged	MQP2020–MCQ
16.	Write the formula to calculate the magnification produced by a spherical mirror.	MQP2020–1
17.	Draw the ray diagram showing the position of the object and image to get the real inverted image whose size is same as the object using a convex lens.	MQP2020–2
18.	An object is kept at the centre of curvature of a concave mirror. The position and nature of the image formed is (A) between F and C and inverted (B) behind the mirror and erect (C) between F and P and erect (D) at the centre of curvature and inverted.	M2020 - MCQ
19.	A 2cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10cm. If the object distance is 15cm, then calculate the image distance and height of the image.	MQP2020–2

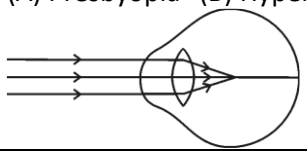
20.	Draw the ray diagram showing the image formation by a convex lens, when the object is kept between principal focus and optic centre. With the help of the diagram mention the nature of the image formed.	MQP2020–3
21.	a) An object is kept between centre of curvature and principal focus of a concave mirror. Write the nature of the image formed. b) Define focal length of a convex mirror. Write the relationship between focal length and radius of curvature of a convex mirror. **OR** a) Give any two examples for refraction of light in daily life. State the laws of refraction of light. b) The power of a lens is -2.5D. Which type of lens is this?	MQP2020–3
22.	An object is kept on the principal axis of a concave mirror of focal length 12 cm. If the object is at a distance of 18 cm from the mirror, calculate the image distance. Determine the nature of the image formed by calculating the magnification produced by the mirror. **OR** A doctor prescribes a corrective lens of power – 0·5 D to a person. Find the focal length of the lens. Is this lens diverging or converging? Give reason. How does the property of this lens can be used to correct eye defects?	M2020 – 3
23.	Draw the ray diagram when the object is kept between F1 and 2F1 of the convex lens. With the help of the diagram mention the position and nature of the image formed. [F1: Principal focus of the lens]	M2020 – 3
24.	The image of the English letter  in convex mirror looks like: (A)  (B)  (C)  (D) 	S2020 – MCQ
25.	Observe the given incomplete diagram. 	S2020 – 1
26.	Object distance and image distance of a lens are –30 cm and –10 cm respectively. Find the magnification and decide the type of lens used and nature of the image.	S2020 – 2
27.	a) State the laws of refraction of light. b) In the given figure, *AB* is the incident ray, *BC* is the refracted ray and *MN* is the normal at the point of incidence. Which medium is more denser? Why?  **OR** a) Differentiate between convex mirror and concave mirror. b) Define the principal focus of a convex lens.	S2020 – 3

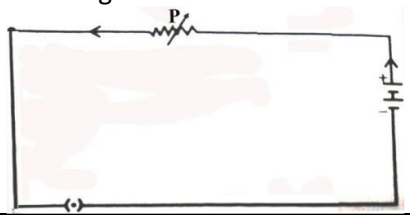
28.	Draw the diagram to show the recombination of the spectrum of white light and label the following parts. a) The ray of light that bends the most b) The ray of light that bends the least.	S2020 – 3
29.	The focal length of a lens is + 0.50 m. The power of the lens and type are (A) + 2.0 D and convex lens (B) + 2.0 D and concave lens (C) – 2.0 D and concave lens (D) – 2.0 D and convex lens	J2021–1
30.	A doctor prescribes a corrective lens of power −0.5D to a person. The focal length of lens and the type is A. −2m and concave lens B. +2m and convex lens C. +2m and concave lens D. −2m and convex lens	MQP2021–MCQ
31.	The nature and the size of the image formed when the object is kept between the principal focus 'F1' and optical centre 'O' of a convex lens is A. virtual, erect and enlarged B. real, inverted and small size C. virtual, inverted and small size D. real, inverted and enlarged	MQP2021–MCQ
32.		
33.	The diameter of the circular outline of a spherical lens is A. optical centre B. centre of curvature C. aperture D. principal axis	MQP2021–MCQ
34.	Object distance and image distance of a lens are −60 cm and −20 cm respectively, then the magnification of lens will be A. – 0.33 B. + 3.0 C. + 0.33 D. + 4.0	MQP2021–MCQ
35.	The position of the image obtained by a convex lens when an object is kept between F1 and 2F1 (F: principal focus of the convex lens) A. between F2 and 2F2 B. at 2F2 C. beyond 2F2 D. at infinity	MQP2021–MCQ
36.	Observe the following table. In which material medium speed of light is very high? **Material medium** / **Refractive index** P – 1.52 Q – 1.44 R – 2.42 S – 1.33 A. Q B. S C. R D. P	MQP2021–MCQ
37.	One of the properties of concave lens is, it A. diverges the light rays B. forms real and inverted image C. is thinner at the edges and thicker at the middle D. converges the light rays	MQP2021–MCQ
38.	The phenomenon of bending of light as it passes from one transparent medium to another is A. refraction of light B. reflection of light C. internal reflection of light D. lateral inversion of light	MQP2021–MCQ
39.	The nature and the size of the image formed when an object is kept between the principal focus *F1* and optical centre *O* of a convex lens are (A) virtual, erect and enlarged (B) real, inverted and small size (C) virtual, inverted and small size (D) real, inverted and enlarged	J2021–1
40.	One property of a convex lens among the following is that, it (A) diverges the light rays (B) is thicker at the edges and thinner at the middle (C) forms real and erect image (D) is thinner at the edges and thicker at the middle	J2021–1
41.	If the power of a lens is − 2.5 D, the focal length of the lens and type is (A) + 0.40 m and convex lens (B) − 0.40 m and convex lens (C) + 0.40 m and concave lens (D) − 0.40 m and concave lens	S2021–1

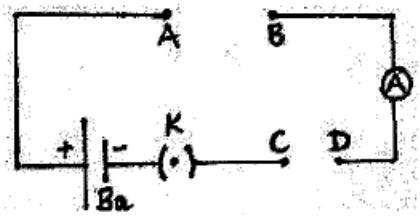
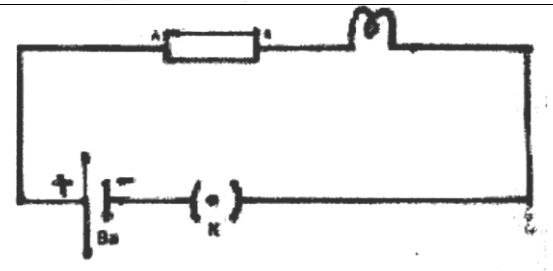
42.	One property of concave lens among the following is, that (A) it converges the light rays (B) is thicker at the edges and thinner at the middle (C) is thinner at the edges and thicker at the middle (D) it forms real and inverted image	S2021–1
43.	If an image is to be formed between F2 and 2F2 in a convex lens, then the object should be placed [F : principal focus of a lens] (A) beyond 2F1 (B) at 2F1 (C) between F1 and 2F1 (D) at focus F1	S2021–1
44.	The distance between the principal focus and the optical centre of a lens is (A) principal axis (B) object distance (C) image distance (D) focal length	S2021–1
45.	The diameter of the reflecting surface of spherical mirror is A) Optical Centre B) Centre of Curvature C) Aperture D) Principal axis	MQP2022–MCQ
46.	If the focal length of a spherical mirror is 15cm. Find the radius of curvature?	MQP2022–1
47.	Draw the ray diagram of image formed when the object is kept beyond 2F1 of the convex lens. With the help of the diagram, mention the position and nature of the image formed. (F1 : principal focus of the lens) **OR** Draw the ray diagram when of image formed the object is kept beyond C of the concave mirror. With the help of the diagram mention the position and nature of the image formed. (C : Centre of curvature of mirror).	MQP2022–3
48.	An object is kept at a distance of 30cm from a diverging lens of focal length 15cm. At what distance the image is formed from the lens? Find the magnification of the image.	MQP2022–3
49.	a) List the uses of Convex mirror and Concave mirror. b) Define principal focus and radius of curvature of a convex mirror.	MQP2022–4
50.	To get diminished and real image of an object from a convex lens, the object should be placed (A) at principal focus F1 (B) between principal focus F1 and 2F1 (C) beyond 2F1 (D) between principal focus F1 and optical centre O.	A2022–1
51.	Mention the SI unit of power of lens.	A2022–1
52.	An object is placed at 25 cm in front of a concave mirror of focal length 15cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image ? **OR** A concave lens has focal length of 15 cm. At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens ?	A2022–2
53.	Draw the ray diagram to show the image formation by a convex lens, when the object is kept at 2F1 of the lens. With the help of the ray diagram mention the position and nature of the image formed. [F1:Principal focus of the lens]	A2022–3
54.	a) What is refraction of light ? State two laws of refraction of light. b) What is refractive index of light ? "The refractive index of diamond is 2·42." What is the meaning of this statement ?	A2022–5
55.	The correct statement among the following related to the Concave lens is, (A) Converges the light rays (B) forms inverted image (C) forms real image (D) diverges the light rays	MQP–2023–MCQ
56.	What is 'Optic centre' of spherical lens?	MQP–2023–1
57.	Ray of light travelling in air enters obliquely into water. Does the light ray bend towards the normal or away from the normal? Why? OR Convex mirror is commonly used as a rear-view mirror in vehicles. Why? Write the relationship between the focal length and radius of curvature of a convex mirror.	MQP–2023–2

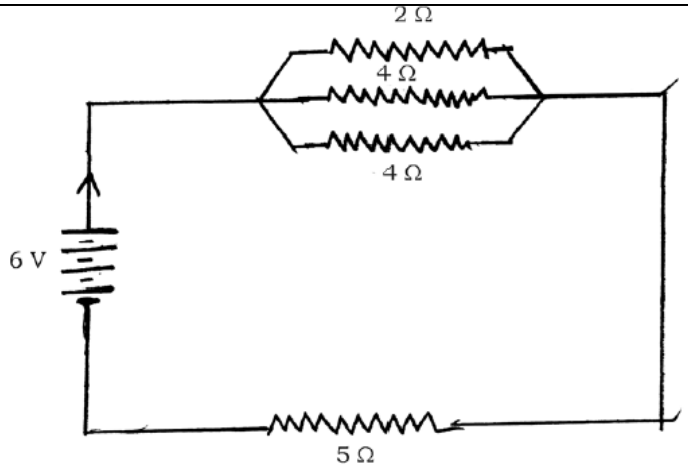
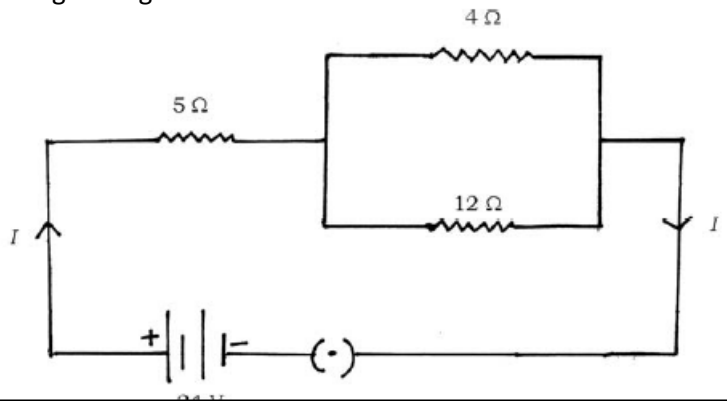
58.	Draw the ray diagram of image formation when the object is kept at 'C' of the concave mirror. With the help of the ray diagram mention the position and the nature of the image formed. (F: Principal focus of the mirror, C: Centre of curvature of mirror)	MQP–2023–3
59.	A light ray enters to rarer medium from a denser medium. Then the speed of that light ray (A) decreases and bends towards the normal (B) increases and bends away from the normal (C) decreases and bends away from the normal (D) increases and bends towards the normal	A2023–MCQ
60.	Light enters from air to benzene having refractive index 1·50. Calculate the speed of light in benzene. (Speed of light in air : 3×10^8 ms^{-1}) OR A concave lens has focal length of 12 cm. At what distance should the object from the lens be placed so that it forms an image at 9 cm from the lens ?	A2023–2
61.	Draw the ray diagram for the image formation in a convex lens when the object is placed beyond 2F1 . Mention the position and nature of the image formed. [F1: Principal focus of the lens]	A2023–3
62.	A mirror forms an erect and enlarged image of an object. Then the type of the mirror and the nature of the image respectively are (A) convex mirror and virtual image (B) concave mirror and real image (C) plane mirror and real image (D) concave mirror and virtual image.	J2023–MCQ
63.	What is meant by the 'aperture' of a spherical mirror? Mention the four uses of a concave mirror. **OR** a) What is meant by the power of a lens ? Write the formula used to find the power of a lens. What is the SI unit of power of a lens ? b) If the focal lengths of two lenses A and B are + 0·50 m and – 0·40m respectively. Mention the types of these lenses in the same order.	J2023–3
64.	Draw the ray diagram for the image formation by a convex lens, when the object is placed at $2F_1$. With the help of the ray diagram mention the position and the nature of the image formed. [*F1* : Principal focus of the lens] OR Draw the ray diagram for the image formation in a convex lens when the object is placed beyond 2F1 . With the help of the ray diagram mention the position and the nature of the image formed. [F1 : Principal focus of the lens]	J2023–3

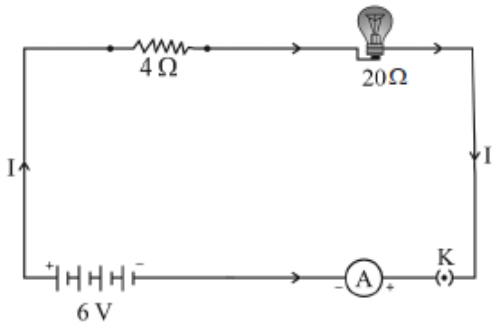
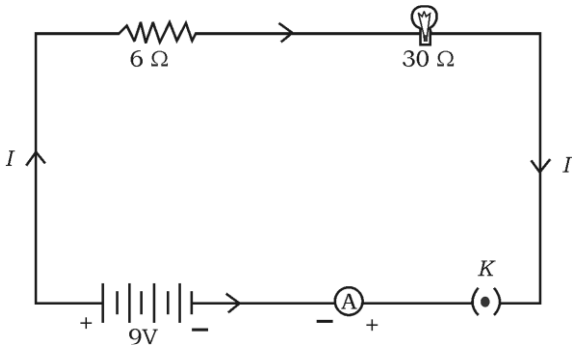
CHAPTER 11 – THE HUMAN EYE AND THE COLOURFUL WORLD		
01.	Red coloured light is used in traffic signals to indicate the vehicles to stop, because compared to other colours red light (A) has high frequency (B) scatters more (C) has less wavelength (D) scatters less	MQP1
02.	The characteristics of the image of an object formed on the retina by the lens of the eye is: (A) Real and inverted (B) Virtual and erect (C) Real and erect (D) Virtual and inverted	MQP1
03.	Water mixed with the milk is taken in beaker 'A' and sugar solution is taken in beaker 'B'. Light is passed through both the beakers. In which beaker the path of light is visible? Why?	MQP1 – 1
04.	What is Myopia? Name the lens used to correct Myopia.	MQP1 – 2
05.	The part of the human eye that controls the amount of light entering into the eye is A) iris B) pupil C) rod and cone D) retina	MCQ2 – MCQ
06.	The change that occurs in the eye to see the distant objects clearly is (A) focal length of the eye lens decreases (B) curvature of the eye lens increases (C) focal length of the eye lens increases (D) ciliary muscles of the eye contract	A2019 MCQ
07.	Observe the given figure. Name the eye defect indicated in the figure and also mention the lens used to correct this defect. 	A2019–2
08.	What is Tyndall effect?	A2019–2
09.	What is dispersion of light? Mention the colour that bends the least and the colour that bends the most when light undergoes dispersion through a prism. **OR** Mention any four phenomena that can be observed due to atmospheric refraction of light on the earth.	A2019–2
10.	What is the function of pupil of the human eye?	J2019 – 1
11.	(i) What is Tyndall effect? (ii) Name the colour that bends the least and the colour that bends the most when white light is dispersed by a prism. **OR** (i) What is meant by the power of accommodation of the eye? (ii) What are the far point and near point of the human eye with normal vision?	J2019 – 2
12.	What is hypermetropia or far–sightedness? Name the type of lens used to correct it.	J2019 – 2
13.	Stars appear to be twinkling but planets do not twinkle. Why? Explain why colour of the clear sky during day appears blue and during sunset appear red.	MQP2020–5
14.	Draw the ray diagram showing myopic eye and correction for myopia. **OR** Draw the ray diagram showing the recombination of the spectrum of white light.	MQP2020–2
15.	a) What is Tyndall effect? Give two examples for Tyndall effect. b) What is the meaning of power of accommodation of eye? How does this help us to see objects at different distances?	MQP2020–4
16.	Explain the experiment conducted by Newton to show that white light contains seven colours. Sun appears red in colour during sunrise but appears white at noon. Explain with the reasons.	M2020 – 5
17.	The sky as seen from the surface of the moon appears dark because, (A) only a little of the blue and violet colours are scattered	S2020 – MCQ

	(B) all the colours are absorbed by the atmosphere present in the moon (C) all the colours are scattered (D) atmospheric particles needed to scatter the light are not present.	
18.	A student sitting in the last bench has difficulty in reading the blackboard writing. Which is the defect of vision the student has? How can it be corrected?	S2020 – 1
19.	How does rainbow form in nature? Explain.	MQP–2023–2
20.	Stars appear to be twinkling. Why? Explain. What are the reasons for the appearance of the sun in red colour during sunrise? OR a) What is meant by power of accommodation of the eye ? b) What is myopia (near sightedness)? What are the reasons that cause this defect ?	MQP–2023–3
21.	Observe the given figure. Identify the eye defect indicated in this figure. (A) Presbyopia (B) Hypermetropia (C) Myopia (D) Cataract 	A2023–MCQ
22.	a) How does rainbow form in the nature ? Explain. Mention the colour of the light that bends the most and that bends the least. b) How does the eye lens accommodate to see the distant objects and nearby objects ? Explain.	A2023–5
23.	a) How does the lens of human eye accommodate to see the nearby objects and the distant objects ? Explain. b) Explain the formation of rainbow in the nature..	J2023–5

CHAPTER 12 – ELECTRICITY		
01.	The SI unit of electric current is (A) Ohm (B) Volt (C) Ampere (D) Watt	MQP1 - MCQ
02.	What is the resistance of a conductor? Mention the factors on which the resistance of a conductor depend. **OR** Mention the disadvantages of connecting electrical appliances in series in domestic wiring.	MQP1 – 2
03.	A potential difference of 220V is applied across a resistance of 440Ω in an electrical appliance. Calculate the current drawn and the heat energy produced in 20 seconds.	MQP1 – 2
04.	Draw the diagram of the electric circuit in which the resistors R1, R2, & R3 are connected in parallel including ammeter and voltmeter and mark the direction of current.	MQP1 – 2
05.	In the figure the device labelled as P is A) Ammeter B)Bulb C) Rheostat D) Voltmeter  	MQP2 – MCQ
06.	The resistance of a conductor is 27Ω. If it is cut into three equal parts and connected in parallel, then its total resistance is (A) 6 Ω (B) 3 Ω (C) 9 Ω (D) 27 Ω	A2019– MCQ
07.	Draw the diagram of an electric circuit in which the resistors R1 , R2 and R3 are connected in parallel including an ammeter and a voltmeter and mark the direction of the current.	A2019–2
08.	It is advantageous to connect electric devices in parallel instead of connecting them in series. Why? **OR** According to Joule's law of heating, mention the factors on which heat produced in a resistor depends. According to this law write the formula used to calculate the heat produced.	A2019–2
09.	An electric refrigerator rated 400 W is used for 8 hours a day. An electric iron box rated 750 W is used for 2 hours a day. Calculate the cost of using these appliances for 30 days, if the cost of 1 kWh is Rs. 3/–.	A2019–2
10.	(i) How does overload and short–circuit occur in an electric circuit? Explain. What is the function of fuse during this situation? (ii) Mention two properties of magnetic field lines.	A2019–4
11.	A piece of metallic wire of resistance R is cut into 3 equal parts. These parts are then connected in parallel. If the total resistance of this combination is R^{I} , then the value of R: R^{I} is	J2019 – MCQ
12.	A bulb is marked 220 V and 40 W. Calculate the current flowing through the bulb and it's resistance.	J2019 – 2
13.	Draw the diagram of a simple electric motor. Label the following parts: (i) Brushes (ii) Battery.	J2019 – 2
14.	(i) Define electric potential difference. How is ammeter connected in an electric circuit? (ii) Explain the application of heating effect of electric current in an electric bulb and the fuse used in an electric circuit. **OR** (i) State Ohm's law (ii) Explain the factors on which the resistance of a conductor depend.	J2019 – 4
15.	A heat producing device should be used in an electric circuit. This device should have A) high resistance and low melting point B) low resistance and high melting point	MQP2020– MCQ

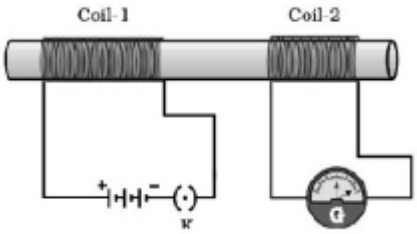
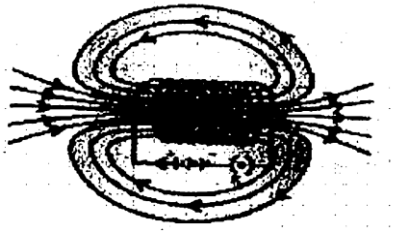
	C) high resistance and high melting point. D) low resistance and low melting point	
16.	Observe the following table a) Reverses the direction of electric current — i) Galvanometer b) Safety device — ii) Commutator c) Detects the presence of electric current — iii) fuse The correct arrangement is A) a -iii b -I c-ii B) a -ii b -i c-iii C) a - ii, b - iii, c -i D) a – iii b -ii c - i	MQP2020–MCQ
17.	Define one volt (1V) potential difference.	MQP2020–1
18.	Draw the circuit diagram showing the combination of resistors R1, R2 and R3 in parallel including ammeter and voltmeter and mark the direction of current.	MQP2020–2
19.	There are two metallic wires of the same thickness made from iron and silver. IF the length of iron wire is 12cm, what should be the length of the silver wire which is equal to the resistance of iron wire? Resistivity of iron = $10x10^{-8}$ Ωm & resistivity of silver = $16x10^{-8}$Ωm.	MQP2020–4
20.	Complete this diagram by connecting two resistors R1 & R2 in series between A and B, also connecting two resistors R3 & R4 in parallel between C & D. 	MQP2020–1
21.	 In the above circuit, which device can be connected in place of AB to increase or decrease the brightness of the bulb? Give reason for your answer.	MQP2020–2
22.	Define ohm's law. Write any two factors on which the resistance of the conductor depend.	MQP202–2
23.	a) Explain any two practical applications of heating effect of electric current. b) An electric bulb is connected to a 220V generator. If the current drawn by the bulb is 0.5A, then calculate the power of the bulb.	MQP2020–4
24.	What is the SI unit of potential difference? Name the device used to measure the potential difference.	M2020 – 1
25.	The resistivity of manganese wire of length 1 m is $1{\cdot}84 \times 10^{-6}$ Ωm at 20°C. If the diameter of the wire is 3×10^{-4} m, what will be the resistance of the wire at that temperature?	M2020 – 2
26.	Observe the given circuit. Calculate the total resistance in the circuit and the total current flowing in the circuit.	M2020 – 2

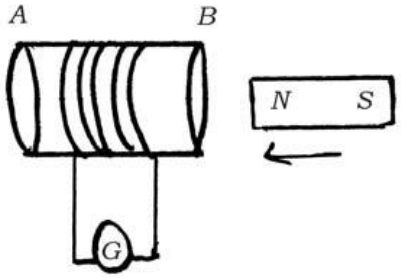
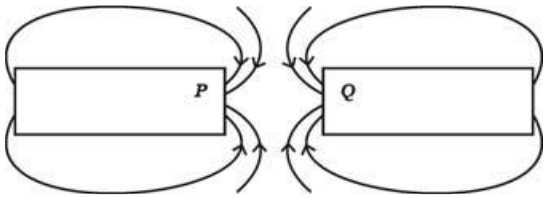
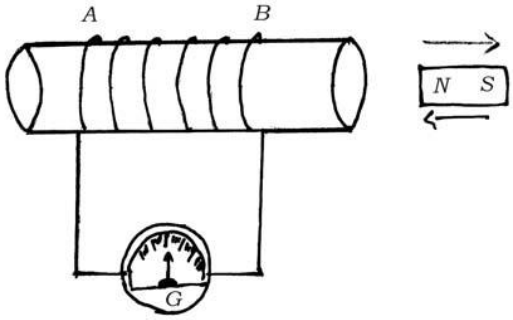
		
27.	State Joule's law of heating. Explain the working of electric filament bulb. **OR** State Ohm's law. How ammeter and voltmeter should be connected in electric circuit? What is the use of these instruments, in the circuit?	M2020 – 3
28.	Observe the given circuit diagram. Calculate the total resistance and the total current flowing through the circuit. 	S2020 – 2
29.	What is the meaning of the statement "The potential difference between two points is 1 V"? Name the device used to measure potential difference. What is resistance of a conductor? What is electric power? Write three formulae used to find it.	S2020 – 4
30.	A device used to change the resistance in an electric circuit is A. ammeter B. rheostat C. galvanometer D. voltmeter	MQP2021– MCQ
31.	The resistance of a conductor does NOT depend on A. length of conductor B. area of cross section of conductor C. magnetic nature D. nature of the material	MQP2021– MCQ
32.	'WATT' is an SI unit of A. electric current B. electric charge C. electric potential difference D. electric power	MQP2021– MCQ
33.	Observe the given table. Good conductor of electricity among these material is **Material** / **Resistivity (Ωm)** K / 6.84×10^{-8} L / 1.62×10^{-8} M / 5.20×10^{-8} N / 2.63×10^{-8} A. K B. L C. N D. M	MQP2021– MCQ
34.	An electric lamp whose resistance is 20Ω and a conductor of 4Ω resistance are connected in series to a 6V battery as shown in figure. Then the total current flowing through the circuit is:	MQP2021– MCQ

	 A. 36AΩ B. 0.6A C. 4A D. 0.25A	
35.	An electric bulb is connected to a 220V generator. If the current flowing in the bulb is 0.50A. The power of the bulb is A. 44W B. 1100W C. 110W D. 220W	MQP2021–MCQ
36.	The function of ammeter in an electric circuit is, it A. reverses the direction of the current B. measures rate of electric current C. protects electrical appliances D. measures the potential difference	MQP2021–MCQ
37.	As the electrical resistivity of a substance increases A. resistance decreases B. conductivity increases C. melting point decreases D. resistance increases	MQP2021–MCQ
38.	The potential difference between the terminals of electric heater is 60V, when it draws a current of 4A from the source. The resistance of electric heater coil is A. 15Ω B. 240Ω C. 24Ω D. 64Ω	MQP2021–MCQ
39.	An electric lamp whose resistance is 30 ∧ and a conductor of 6 ∧ resistance are connected in series to 9V battery as shown in the figure. The total current flowing in the circuit is  (A) 4 A (B) 36 A (C) 0.25 A (D) 0.6 A	J2021–1
40.	The metal used in the filament of an electric bulb is (A) manganese (B) tungsten (C) nickel (D) chromium	J2021–1
41	A device used to change the resistance in the electric circuit is (A) voltmeter (B) ammeter (C) galvanometer (D) rheostat	J2021–1
42.	'Ohm' is the SI unit of (A) electric potential difference (B) resistance (C) electric current (D) electric charge	J2021–1
43.	In which material medium the speed of light is very high ? *Material medium* / *Refractive index* *P* / 1.52 *Q* / 1.44 *R* / 2.42 *S* / 1.33 (A) *Q* (B) *P* (C) *S* (D) *R*	J2021–1
44.	The SI unit of electric potential difference is (A) volt (B) ampere (C) ohm (D) coulomb	S2021–1

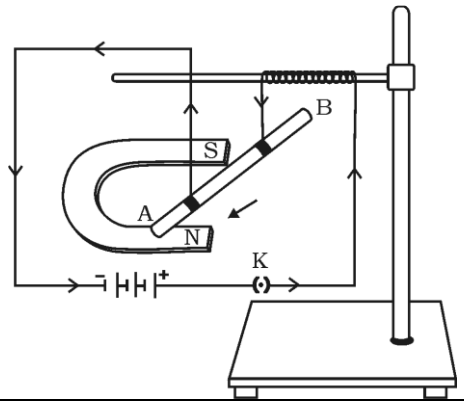
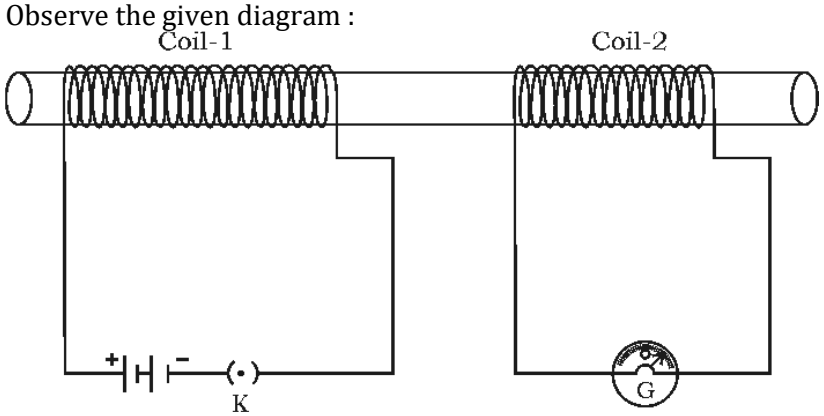
<table>
<tr><td>45.</td><td>The resistance of an electric heater coil is 110 Ω. Then electric current, that an electric heater draws from a 220 V source is:
(A) 0.5 A (B) 0.11 A (C) 2 A (D) 3 A</td><td>S2021–1</td></tr>
<tr><td>46.</td><td>A device that is connected in series in an electric circuit is
(A) voltmeter (B) bar magnet (C) turbine (D) ammeter</td><td>S2021–1</td></tr>
<tr><td>47.</td><td>Observe the following table :
<table><tr><th>Material</th><th>Resistivity (Ωm)</th></tr><tr><td>K</td><td>2.63×10^{-8}</td></tr><tr><td>L</td><td>5.20×10^{-8}</td></tr><tr><td>M</td><td>1.60×10^{-8}</td></tr><tr><td>N</td><td>6.84×10^{-8}</td></tr></table>The best conductor of electricity among these materials is
(A) N (B) M (C) K (D) L</td><td>S2021–1</td></tr>
<tr><td>48.</td><td>An electric motor takes 5A from a 220V electric source. The power of the motor is
A) 1100W B) 44W C) 225W D) 440W</td><td>MQP2022–MCQ</td></tr>
<tr><td>49.</td><td>What is an electric circuit?</td><td>MQP2022–1</td></tr>
<tr><td>50.</td><td>An electric lamp whose resistance is 40Ω and conductor of 8Ω resistance are connected in series to 12V battery in an electric circuit. Calculate the total resistance of the circuit and the current flowing through the circuit.</td><td>MQP2022–2</td></tr>
<tr><td>51.</td><td>What is electric potential difference? What is the SI unit of potential difference? Name the device used to measure the potential difference.</td><td>MQP2022–3</td></tr>
<tr><td>52.</td><td>The device used to produce electricity is
(A) Galvanometer (B) Electric generator (C) Ammeter (D) Electric motor.</td><td>A2022–1</td></tr>
<tr><td>53.</td><td>The correct formula that shows the relationship between potential difference, electric current and resistance in an electric circuit is
(A) $I = \frac{R}{V}$ (B) $I = VR$
(C) $V = \frac{I}{R}$ (D) $R = \frac{V}{I}$.</td><td>A2022–1</td></tr>
<tr><td>54.</td><td>Draw the schematic diagram of an electric circuit comprising of electric cell, electric bulb, ammeter and plug key.</td><td>A2022–2</td></tr>
<tr><td>55.</td><td>a) What are the advantages of connecting electrical devices in parallel in an electric circuit instead of connecting them in series ?
b) How are ammeter and voltmeter connected in an electric circuit ? What are their function ?</td><td>A2022–4</td></tr>
<tr><td>56.</td><td>The resistivity (Ωm) of four materials A, B, C and D are 6.84×10^{-8}, 1.62×10^{-8}, 5.20×10^{-8} and 2.63×10^{-8} respectively. Which of these materials has very less electric conductivity?
(A) Material B (B) Material C (C) Material A (D) Material D</td><td>MQP–2023–MCQ</td></tr>
<tr><td>57.</td><td>Draw the symbol diagram of two electric cells that are connected in series in an electric circuit.</td><td>MQP–2023–1</td></tr>
<tr><td>58.</td><td>a) Two resistors of resistance 5Ω and 20Ω are connected in parallel and connected to a 12V battery. Calculate the total resistance in the electric circuit and the total current flowing in this circuit.
b) 200 J of heat is produced in two seconds in a 8 Ω resistance. Find the potential difference across the resistor.</td><td>MQP–2023–4</td></tr>
<tr><td>59.</td><td>The device used to measure the rate of current in a circuit is
(A) Ammeter (B) Voltmeter (C) Galvanometer (D) Battery</td><td>A2023–MCQ</td></tr>
</table>

60.	Write the symbols of the following components used in an electric circuit. i) Rheostat ii) Wires crossing without joining	A2023–1
61.	State Ohm's law. On which factors does the resistance of a conductor depend ? Mention the SI unit of electric power. **OR** State Joule's law of heating. How is fuse connected in the circuits ? Name the metal used in the filament and the gas filled in electric bulb.	A2023–3
62.	The resistors R1 ,R2 and R3 have the values 10 Ω, 20 Ω and 60 Ω respectively, which have been parallelly connected to a battery of 24 V in an electric circuit. Then calculate the following : i) The current flowing through each resistor ii) The total current in the circuit iii) The total resistance of the circuit.	A2023–3
63.	Draw the symbol diagram of rheostat used in electric circuit.	J2023–1
64.	1000 J of heat is produced each 2 seconds in a 5 Ω resistor. Find the potential difference across the resistor. **OR** A wire of given material having length 'l' and area of cross–section 'A' has a resistance of '4 Ω'. Find the resistance of another wire of the same material having length l/2 and area of cross-section '2A'.	J2023–2
65.	a) A bread-toaster rated 350 W is used for 15 hours a day. An electric iron box rated 250 W is used for 5 hours a day. Calculate the cost of using these appliances for 30 days, if the cost of 1 kWh is Rs. 4. b) In which method the resistors R1 and R2 could be connected so that the equivalent resistance of that electric circuit becomes low ? What is the change in the value of current in the circuit by this type of connection ?	J2023–4

CHAPTER 13 – MAGNETIC EFFECT OF ELECTRIC CURRENT		
01.	Draw the diagram of an electric motor and label the following parts (i) Split rings (ii) Armature	MQP1 – 2
02.	In the figure as the current changes in coil-1 the galvanometer connected to coil-2 shows deflection. Explain the phenomenon that causes this effect. Name and state the law used to know the direction of current in the device that works due to this phenomenon. 	MQP1 – 4
03.	The magnetic field around a current carrying circular loop can be increased by A) increasing the radius of the coil. B) converting the coil into straight wire. C) decreasing the radius of the coil. D) reducing the amount of electric current through the coil.	MQP2 – MCQ
04.	Draw the diagram of a simple electric motor. Label the following parts (i) Split rings (ii) Brushes.	A2019–3
05.	You are given a copper coil, 6V battery and iron filings. What effects of electric current can you demonstrate using these materials?	MQP2020–1
06.	Define the rule used to identify the direction of induced current in an electric generator. How can we increase the amount of electric current produced in the electric generator? Mention the property of the current produced by AC generator. Mention an important advantage of this type of current. OR On what principle an electric motor works? Define the rule used to identify the direction of force on the conductor in an electric motor. Explain the parts used in a commercial motor.	MQP2020–3
07.	Observe the following figure. We can understand that  A) there is a uniform magnetic field around the solenoid B) the magnetic field is same at all points inside the solenoid C) solenoid is kept in a strong magnetic field D) solenoid is experiencing mechanical force	MQP2020– MCQ
08.	Give scientific reason: "The magnetic field produced by a current carrying conductor increases as the number of turns in the coil increases".	MQP2020–1
09.	A student connects a water heater to a 5A electric circuit. Is this correct? Give suitable reason to your answer.	MQP2020–1
10.	Draw the diagram of an electric motor and label split rings.	MQP2020–2
11.	An electric motor is taken out from a toy car. How do you convert this motor into a small electric generator? Compare the function of electric generator with the phenomenon electromagnetic induction.	MQP2020–3
12.	Observe the given figure. What type of current is induced in the coil by doing the experiment related to this figure? Give reason for your answer.	M2020 – 1

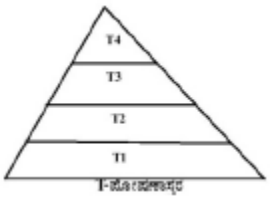
		
13.	Draw the diagram of a simple electric generator. Label the following parts: i) Brushes ii) Rings.	M2020 – 2
14.	How do you trace the magnetic field lines around a bar magnet using compass needle? Explain. Write the properties of magnetic field lines.	M2020 – 4
15.	Observe the diagram. The magnetic poles represented by P and Q respectively are:  (A) south (S) and south (S) (B) north (N) and south (S) (C) north (N) and north (N) (D) south (S) and north (N).	S2020 – MCQ
16.	Suggest any two measures to avoid overloading in domestic circuits.	S2020 – 1
17.	Observe the given diagram. Explain the experiment related to this diagram. What conclusions can be drawn from this experiment? 	S2020 – 4
18.	In Fleming's left hand rule middle finger indicates the direction of the A. magnetic field B. electric current induced in conductor C. electric current D. movement of the conductor	MQP2021– MCQ
19.	The function of electric generator is, it A. reverses the direction of the current B. converts electrical energy into mechanical energy C. detects the presence of electric current in circuit D. converts mechanical energy into electrical energy	MQP2021– MCQ
20.	D.C. generator works on the principle of A. electromagnetic induction B. magnetic effect of electric current C. heating effect of electric current D. chemical effect of electric current	MQP2021– MCQ
21.	A safety device used to protect the electric circuit and electric appliances is A. ammeter B. fuse C. commutator D. galvanometer	MQP2021– MCQ
22.	In Fleming's right hand rule middle finger indicates direction of the A. electric current induced in a conductor B. movement of the conductor C. magnetic field D. electric current	MQP2021– MCQ

23.	A rectangular coil of copper wire is rotated in a magnetic field. The direction of induced current changes ones in each A. two revolutions B. one revolution C. half revolution D. one-fourth revolution	MQP2021–MCQ
24.	Which of the following is NOT a property of magnetic lines? A. magnetic field lines are dense near poles B. magnetic field lines are closed loops C. magnetic field lines intersect each other D. magnetic field lines emerge from north pole and merge at the south pole	MQP20221–MCQ
25.	The device that works on the principle of electromagnetic induction is (A) electric generator (B) electric heater (C) electric motor (D) electric fan	J2021–1
26.	A rectangular coil of copper wire is rotated in a magnetic field. The direction of the induced current changes once in each (A) two revolutions (B) one revolution (C) half revolution (D) one-fourth revolution	J2021–1
27.	The magnetic field lines inside a solenoid are in the form of parallel straight lines. The reason for this is, the magnetic field inside the solenoid is (A) very high (B) uniform (C) zero (D) produced by electric current	J2021–1
28.	The device that converts electrical energy into mechanical energy is (A) electric generator (B) solar cell (C) dry cell (D) electric motor	J2021–1
29.	Which of the following is *'NOT'* a property of magnetic field lines? (A) Magnetic field lines are dense near the poles (B) Magnetic field lines are closed loops (C) Magnetic field lines intersect each other (D) Magnetic field lines emerge from north pole and merge at the south pole	S2021–1
30.	In Fleming's right-hand rule, the middle finger indicates the direction of (A) electric current induced in conductor (B) magnetic field (C) movement of conductor (D) force	S2021–1
31.	A device that reverses the direction of flow of current in an electric circuit is (A) Ammeter (B) Commutator (C) Voltmeter (D) Galvanometer	S2021–1
32.	The function of fuse in an electric circuit is that, it (A) reverses the direction of an electric current (B) shows the direction of motion of the electric current (C) measures the potential difference (D) protects the electrical appliances	S2021–1
33.	How does overloading and short-circuit occur in an electric circuit? Explain. What is the function of a fuse during this situation ?	MQP2022–2
34.	Explain Faraday's experiment of magnet and coil. State "electromagnetic induction" with the help of this experiment **OR** State the Fleming's right hand rule. How can we increase the amount of electric current produced in the electric generator ? Write any two differences between electric generator and electric motor?	MQP2022–4
35.	In Fleming's right hand rule, the middle finger indicates the direction of (A) induced electric current (B) magnetic field (C) motion of the conductor (D) mechanical force.	A2022–1
36.	Magnetic field lines do not intersect each other. Why ?	A2022–1
37.	What are the functions of an earth wire ? It is necessary to connect the electric appliances having metallic body to earth wire in domestic electric circuit. Why ? Explain. **OR** Explain Faraday's experiment related to electromagnetic induction. Mention the difference between direct and alternate current.	A2022–3

38.	The device used to change the resistance at many times in the electric circuit is (A) Electric generator (B) Electric motor (C) Galvanometer (D) Rheostat	MQP–2023–MCQ
39.	What is solenoid? List the properties of the magnetic field due to the flow of electric current in a solenoid.	MQP–2023–2
40.	a) Coil-1 is connected to the battery and plug key and Coil-2 with a galvanometer are kept close to each other as shown in the diagram. Write your observation in the galvanometer. When i) plug key K is closed and ii) plug key K is opened Give reasons for your observations. b) Write the functions of the following. i) Earthing wire ii) Electric fuse	MQP–2023–4
41.	What does the thumb indicate in the right hand thumb rule ?	A2023–1
42.	a) What is solenoid ? Write the properties of the magnetic field lines formed around a current carrying solenoid. b) What is alternating current ? Electric appliances having metallic body are connected to earth wire, why ?	A2023–4
43.	A device that converts electrical energy into mechanical energy is (A) Electric generator (B) Electric motor (C) Galvanometer (D) Voltmeter.	J2023–MCQ
44.	Imagine, you are holding a straight current carrying conductor as per the right hand thumb rule. If the thumb is upward, then the direction of the field lines of the magnetic field is (A) downward (B) upward (C) anti-clockwise (D) clockwise.	J2023–MCQ
45.	Observe the figure and mention the direction of the force acting on the current carrying conductor *AB*. Name the rule that helped you to find the direction of the force.  	J2023–1
46.	Observe the given diagram :  Explain the experiment related to this diagram. What conclusions can be drawn from this experiment ?	J2023–3

CHAPTER 14 – SOURCES OF ENERGY		
01.	Explain the structure of a bio gas plant and the process of production of fuel in bio gas plant. **OR** "We cannot establish nuclear power reactors everywhere though large amount of electricity is produced by nuclear energy" Why? Explain.	MQP1 – 3
02.	(i) Name the major constituent of biogas. Write the properties of biogas which make it a good fuel. (ii) Name the two devices that work using heat energy of the sun. **OR** (i) Write the advantages of solar cells. (ii) Write any two hazards of nuclear power generation.	A2019–3
03.	Which of the following is eco–friendly? (A) Thermal power plant (B) Hydropower plant (C) Biogas plant (D) Nuclear power station.	J2019 – MCQ
04.	List the characteristics of a good source of energy.	J2019 – 2
05.	What is nuclear energy? What are the hazards of nuclear power generation? **OR** List four characteristics of a good source of energy. Name any two sources of energy which are dependent on solar energy.	MQp2020–3
06.	The power plant in which natural source of energy is directly used to rotate turbines is (A) thermal power plant (B) hydro-electric power plant (C) nuclear power plant (D) solar power plant.	M2020 – MCQ
07.	In a power station coal is burnt to heat water to produce steam which further runs the turbine to generate electricity. This power station is a A) Thermal power plant because coal is burnt B) Hydro power plant because water is heated C) Nuclear power plant because turbine runs D) Bio gas power plant because coal is used	MQP2020–MCQ
08.	"We need to look for alternative sources of energy". Justify this statement scientifically.	MQP2020–2
09.	"Biogas plant is a boon to farmers." Why?	M2020 – 1
10.	a) Explain how is nuclear energy generated in power reactors. How is electricity produced from nuclear energy? b) Mention two hazards of nuclear power reactor. **OR** a) Explain why we are looking at the alternative sources of energy. b) Mention the advantages and disadvantages associated with solar cells.	S2020 – 3
11.	The inner wall of the solar cooker is painted black because this A. reflects light B. absorbs more heat C. prevents from rusting D. converges solar radiations	MQP2021–MCQ
12.	One of the properties of biogas A. Its heating capacity is high B. Leaves residue like ash C. It burns with smoke D. Its heating capacity is low	MQP2021–MCQ
13.	The power plant that does not use turbine to generate electricity is A. Solar power plant B. Nuclear power plant C. Hydroelectric power plant D. Thermal power plant	MQP2021–MCQ
14.	A major component of biogas is A. ethane B. methane C. butane D. propane	MQP2021–MCQ
15.	The inner wall of the solar cooker is painted black because this (A) reflects light (B) converges solar radiations (C) prevents from rusting (D) absorbs more heat	J2021–1

16.	The source of energy in nuclear power reactor is (A) nuclear fission reaction (B) controlled nuclear fission chain reaction (C) exothermic reaction (D) nuclear fusion reaction	J2021–1
17.	The major component of compressed natural gas is (A) butane (B) ethane (C) methane (D) propane	J2021–1
18.	The power plant that uses the natural source of energy directly to rotate the turbines is (A) Thermal power plant (B) Hydro-electric power plant (C) Nuclear power plant (D) Solar power plant	S2021–1
19.	Mention any two disadvantages of fossil fuels.	MQP2021–1
20.	Draw the schematic diagram of a biogas plant.	MQP2022–2
21.	Which is the major component of biogas ? Write four characteristics of a good source of energy. OR Which element is used in making solar cell ? Write any four advantages of solar cells.	A2022–3
22.	Explain the method of production of biogas in biogas plant and write any two characteristics of biogas. OR How power is generated from nuclear energy? Explain. Write any two hazards of nuclear power generation.	MQP–2023–3
23.	The inner wall of the solar cooker is painted black. Because black colour (A) reflects light (B) converges solar rays (C) prevents from rusting (D) absorbs more heat	A2023–MCQ
24.	Name the major constituent of biogas and write the properties of biogas. OR List the hazards of nuclear power generation.	A2023–2
25.	Coal and petroleum products should be used judiciously. Why ?	A2023–3
26.	The power plant that generates electricity without using the turbines is (A) Thermal power plant (B) Hydro power plant (C) Solar power plant (D) Nuclear power plant.	J2023–MCQ
27.	Name any two fossil fuels and mention any two disadvantages of using fossil fuels.	J2023–1

CHAPTER 15 – OUR ENVIRONMENT		
01.	Observe the figure and answer the given questions. (i) Which trophic level has maximum number of organisms? Why? (ii) In which trophic level chemicals like DDT are accumulated in highest concentration? Why?  	MQP1 – 2
02.	Flow of energy is unidirectional in an ecosystem because in each trophic level A) Number of consumers is constant B) Number of consumers reduces C) Loss of energy is more than the amount of available energy D) Available energy is completely consumed by consumers	MQP2 – MCQ
03.	A food chain in a polluted aquatic ecosystem is given. Observe it and answer the following questions. Fresh water → Algae → Fishes → Birds. (i) Which organisms are disturbed more due to biomagnification? Why? (ii) This ecosystem will be destroyed gradually due to biomagnification. Why? **OR** A student places a piece of cucumber, a glass piece, a banana peel and a plastic pen in a pit and closes it. What changes can be observed in these materials after a month? Give scientific reason for these changes.	A2019–2
04.	Observe the food chain given below: Grass → Grass hopper → Frog → Snake → Eagle. If the energy available at first trophic level is 5000 J, then the amount of energy available for snake is (A) 500 J (B) 5 J (C) 0·5 J (D) 50 J.	J2019 – MCQ
05.	Micro–organisms like bacteria are called decomposers. Why?	J2019 – 1
06.	Name the factors responsible for speciation.	J2019 – 1
07.	Imagine that in an area containing green bushes, almost equal number of brown grasshoppers and green grasshoppers are living. Which grasshopper would be eaten by birds easily? Why? Population of which grasshoppers increase gradually? Name the phenomenon which directs evolution here.	MQP2020–2
08.	Explain the flow of energy and harmful chemicals in an ecosystem.	MQP2020–3
09.	In the environment, materials causing biomagnification A) get recycled quickly B) decompose only in soil C) remain as permanent residues D) are stored in less amount in trophic levels	MQP2020–MCQ
10.	Use of CFC free refrigerators is considered as eco friendly. Why?	MQP2020–1
11.	Why are branched food chains will be formed in ecosystem? How does energy travel in these food chains?	MQP2020–3
12.	"The body temperature of frogs and lizards depend on temperature in the environment." Justify.	M2020 – 2
13.	"As energy moves progressively through various trophic levels of food chain it is no longer available to the previous level." Give reasons.	M2020 – 2
14.	In the alpine meadows of the great Himalayan National Park, the practice of regular grazing by sheep was put to an end. What are the effects on the meadows due to this measure?	S2020 – 1
15.	Give reason: a) Food chains generally consist of only three or four steps. b) Decomposers play an important role in an ecosystem. c) Protecting of ozone layer is necessary.	S2020 – 3

16.	Ozone layer is formed from oxygen at the higher levels of the atmosphere by the action of A. X-rays B. Ultra violet - radiations C. Infrared radiations D. Radio waves	MQP2021–MCQ
17.	A product that can no more be used for the original purpose but use it for some other useful purpose is A. recycle B. reduce C. reuse D. repurpose	MQP2021–MCQ
18.	Which of the following is the bio-diversity hot spots? A. Deserts B. Rivers C. Oceans D. Forests	MQP2021–MCQ
19.	A group that contains only bio-degradable substances among the following is A. polythene, wood, leather B. leather, detergent, plastic C. wood, grass, leather D. paper, bakelite, grass	MQP2021–MCQ
20.	The correct statement with respect to biodegradable substances among the following. These substances (A) undergo recycling naturally in the environment (B) harm various organisms in the ecosystem (C) increase the density of harmful chemicals in different tropic levels (D) remain inert in the environment for a long time	J2021–1
21.	A student does not use plastic straws given by the shopkeepers while drinking tender coconut, juice. The measure taken by him related to conservation of environment is (A) Recycle (B) Reuse (C) Reduce (D) Refuse	S2021–1
22.	The materials that change slowly their form and structure in the environment are (A) Plant fibres (B) Peels of vegetables (C) Waste papers (D) Used tea leaves	S2021–1
23.	What is the role of decomposer in an ecosystem?	MQP2022–1
24.	Write any two differences between biodegradable and non–biodegradable Substances. **OR** Write a grassland food chain and name the different tropic levels in it.	MQP2022–2
25.	"The flow of energy in an ecosystem is unidirectional" How ? Justify.	MQP2022–2
26.	Atmospheric layer that absorbs ultraviolet radiations coming from the sunlight is made up of this molecule, (A) N_2 (B) H_2 (C) O_3 (D) O_2	A2022–1
27.	What is the role of decomposers in an ecosystem?	A2022–2
28.	What is trophic level? Flow of energy in an ecosystem is always unidirectional. Why ? Explain.	A2022–3
29.	Algae → Small insects → Large insects → Small fish → Large fish → Human. The arrangement of trophic levels in this food chain are in the (A) increasing order of energy availability. (B) increasing order of both energy availability and storage of harmful chemicals. (C) increasing order of storage of harmful chemicals. (D) decreasing order of both energy availability and storage of harmful chemicals.	MQP–2023–MCQ
30.	What is the function of ozone layer?	MQP–2023–1
31.	Give an example for a food chain of grassland ecosystem. If there is an increase in the number of organisms in the second trophic level, how does this affect on that food chain ?	A2023–2
32.	Producers of aquatic eco-system are (A) algae (B) small fishes (C) larvae (D) protozoa.	J2023–MCQ
33.	What is biological magnification ?	J2023–1

CHAPTER 16 –SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES		
01.	The watershed management (A) increases droughts and floods (B) increases production and income of the watershed community (C) decreases the biodiversity of the down-stream reservoirs (D) increases deforestation	MQP1
02.	"Practice of reuse and recycle of materials will contribute to maintain sustainity of the environment". Support this statement with reasons.	MQP1 – 2
03.	Method of managing used envelopes: Reuse:: Method of managing fuels: A) Recycling B) Use for repurpose C) Reduce the use D) Refuse the use	MQP2 – MCQ
04.	By constructing Khadin check–dams in level terrains: (A) underground water level decreases (B) underground water level increases (C) vegetation in the nearby areas are destroyed due to excess moisture (D) underground water gets polluted	A2019– MCQ
05.	List the disadvantages of using fossil fuels. **OR** List the advantages of 'reduce' and 'reuse' to save environment.	A2019–2
06.	(i) How does combustion of fossil fuels cause greenhouse effect? (ii) List the reasons for failure in sustaining ground water. **OR** (i) Reuse of plastic products is better than recycle method. Why? (ii) "Local people are stakeholders of forest resources." Explain.	J2019 – 3
07.	The traditional method of sustainable natural resource management is A) Following water harvesting method B) Minimising the establishment of factories C) Using fossil fuels abundantly D) Preventing overgrazing of cattle in forest areas	MQP2020– MCQ
08.	What is the meaning of "Repurpose" with respect to conservation of environment?	MQP2020– 1
09.	Which ancient systems of water harvesting can be rejuvenated? What is the major advantage of these methods? **OR** Conscious usage of natural resources nowadays is inevitable why? Mention the reasons.	MQP2020– 3
10.	"Building crescent shaped earthen embankment in level terrain is better than the construction of large dams across the river to store water." Analyse this statement with their effects.	M2020 – 3
11.	Name the poisonous gas produced due to incomplete combustion of fossil fuels.	S2020 – 1
12.	The watershed management A. Increases production and income of watershed community B. Increases droughts and floods C. Decreases the biodiversity of downstream reservoirs D. Increases deforestation	MQP2021– MCQ
13.	The main purpose of constructing water harvesting structures is to A. hold rainwater on the surface of the earth B. use water for irrigation C. use water for fish farming D. recharge the ground water	MQP2021– MCQ
14.	Saving electricity by switching off unnecessary work of lights and fans is an example of (A) refuse (B) reduce (C) reuse (D) repurpose	J2021–1
15.	Which of the following is NOT the advantage of water harvesting structures ? (A) Recharge the ground water (B) Water does not evaporate (C) Provide breeding grounds for mosquitoes (D) Provide moisture for vegetation	J2021–1

16.	The people who are *'NOT'* direct stakeholders in the conservation of forest are (A) the people who have paper mill near the forest (B) the people who live in urban areas (C) the people who run the forest department (D) the people who live in and around the forest	S2021–1
17.	Rejuvenating ancient water harvesting systems is being encouraged. Why?	MQP–2023–1
18.	What needs of the local people are fulfilled by the forest?	MQP–2023–2
19.	Mention the two importance of 'Recycling' in controlling environmental pollution.	J2023–2
20.	What needs of the local people are fulfilled by the forest ?	J2023–2

MATCH FOLLOWING

01. Functions of certain structures of nervous system in animals are given in column 'A' and the names of these structures are given in column 'B'. Match them

Column – 'A'	Column – 'B'
i. Carries involuntary quick responses	a) Peripheral nervous system
ii. Controls voluntary and conscious thinking	b) Medulla
iii. Maintains precision in voluntary actions and balance of the body	c) Reflex Arc
iv. Facilitates the communication between central nervous system and the other body parts	d) Dendrite
	e) Axon
	f) Cerebellum
	g) Fore brain

MQP1

02. The functions of hormones are given in Column–A and the names of the hormones are given in Column–B. Match them and write the answer along with its letters:

Column - A	*Column - B*
(A) Prepares the body to deal with the situation	(i) Growth hormone
(B) Regulates metabolism for body growth	(ii) Testosterone
(C) Regulates blood sugar levels	(iii) Adrenaline
(D) Regulates the growth and development of the body	(iv) Progesterone
	(v) Insulin
	(vi) Thyroxine
	(vii) Oestrogen.

A2019–4

03. The names of devices are given in Column–A and corresponding functions are given in Column–B. Match them and write the answer along with its letters:

J2019 – 4

	Column - A	***Column - B***	
	(A) Commutator	(i) detects the presence of electric current in a circuit	
	(B) Fuse	(ii) converts mechanical energy into electrical energy	
	(C) Galvanometer	(iii) measures the potential difference	
	(D) Electric generator	(iv) shows the direction of the motion of the conductor	
		(v) protects the electrical appliances	
		(vi) reverses the direction of current	
		(vii) converts electrical energy into mechanical energy	

DIAGRAMS		
01.	Draw the diagram of an electric motor and label the following parts (i) Split rings (ii) Armature	MQP1 – 2
02.	Draw the diagram of the electric circuit in which the resistors R1, R2 & R3 are connected in parallel including ammeter and voltmeter and mark the direction of current.	MQP1 – 2
03.	Draw the diagram of the arrangement of apparatus to know the reaction of Zinc granules with dilute sulphuric acid and testing hydrogen gas and label the part that contain zinc granules and sulphuric acid.	MQP1 – 2 MQP2020–2
04.	Draw the diagram showing the germination of pollen on stigma and label the following parts. (i) Stigma (ii) Pollen Tube	MQP1 – 2
05.	Draw the ray diagram showing the formation of image when the object is kept beyond centre of curvature (C) of a concave mirror.	MQP1 – 2
06.	Draw the diagram showing the structure of a nephron and label the following parts (i) Glomerulus (ii) Bowman's capsule	MQP1 – 3
07.	Draw the diagram of the apparatus used to test the conductivity of sodium chloride solution and label the graphite rod and the part where sodium chloride solution is present.	MQP1 – 3
08.	Draw the diagram showing the longitudinal section of a flower. Label the following parts (i) Style (ii) Anther.	A2019–2
09.	Draw the diagram of an electric circuit in which the resistors R1, R2 and R3 are connected in parallel including an ammeter and a voltmeter and mark the direction of the current.	A2019–2
10.	Draw the diagram of the apparatus used in the electrolysis of water. Label the following parts. (i) Graphite rod (ii) Cathode.	A2019–2 J2019 – 3
11.	Draw the diagram of a simple electric motor. Label the following parts (i) Split rings (ii) Brushes.	A2019–2
12.	Draw the diagram of arrangement of apparatus used to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts. (i) Soap solution (ii) Delivery tube.	A2019–2
13.	Draw the ray diagrams for the image formation in a convex lens when an object is placed (i) at focus F1 (ii) beyond 2F1.	A2019–3
14.	Draw the diagram showing the sectional view of the human heart. Label the following parts. (i) Aorta (ii) Chamber of the heart that receives deoxygenated blood.	A2019–3
15.	Draw the diagram of the arrangement of apparatus to show the action of steam on a metal. Label the following parts: (i) Metal sample (ii) Delivery tube.	J2019 – 3
16.	Draw the diagram showing opened stomata. Label the following parts: (i) Guard cells (ii) Stomatal pore.	J2019 – 2
17.	Draw the diagram showing the structure of neuron. Label the following parts: (i) The part which has prominent nucleus (ii) Dendrite	J2019 – 2
18.	Draw the diagram showing the germination of pollen on stigma and label the part on which pollination takes place.	J2019 – 2
19.	Draw the circuit diagram showing the combination of resistors R1, R2 and R3 in parallel including ammeter and voltmeter and mark the direction of current.	MQP2020–2
20.	Draw the ray diagram showing the position of the object and image to get the real inverted image whose size is same as the object using a convex lens.	MQP2020–2
21.	Draw the diagram showing the structure of human alimentary canal and label the following parts. a) the part which stores bile juice. b) the longest part of the alimentary canal.	MQP2020–4
22.	Draw the diagram showing longitudinal section of a flower and label the part where pollination takes place.	MQP2020–2

23.	Draw the diagram of the arrangement of apparatus to show the action of steam on a metal and label the part where hydrogen is collected.	MQP2020–2
24.	Draw the ray diagram showing myopic eye and correction for myopia. **OR** Draw the ray diagram showing the recombination of the spectrum of white light.	MQP2020–2
25.	Draw the diagram of an electric motor and label split rings.	MQP2020–2
26.	Draw the diagram showing the structure of human excretory system and label the part that collects urine.	MQP2020–2
27.	Draw the diagram showing longitudinal section of human brain and label the following parts. i) Part of hind brain that controls involuntary functions ii) The part that interprets sensory information	MQP2020–3
28.	Draw the diagram of the apparatus to show that acid solution in water conducts electricity. Label the following parts i) Dil. HCl solution ii) Rubber cork.	M2020 -2
29.	Draw the diagram of arrangement of the apparatus to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts i) Test tube ii) Soap solution.	M2020 – 2
30.	Draw the diagram showing the germination of pollen on stigma and label the pollen tube.	M2020 - 2
31.	Draw the diagram showing the schematic sectional view of the human heart. Label the following parts i) Aorta ii) Pulmonary veins.	M2020 – 3
32.	Draw the ray diagram when the object is kept between F1 and 2F1 of the convex lens. With the help of the diagram mention the position and nature of the image formed. [F1: Principal focus of the lens]	M2020 – 3
33.	Draw the diagram of a simple electric generator. Label the following parts: i) Brushes ii) Rings.	M2020 – 2
34.	Draw the diagram of the arrangement of apparatus to show that acid solution in water conducts electricity and label the battery.	S2020 – 2
35.	Draw the diagram of the arrangement of apparatus showing the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning and label the zinc granules.	S2020 – 2
36.	Draw the diagram of the apparatus used in refining of copper from copper sulphate solution. Label the following parts i) Cathode ii) Anode mud.	S2020 – 2
37.	Draw the diagram showing longitudinal section of human brain. Label the following parts a) Mid brain b) Gland which stimulates growth in all organs.	S2020 – 4
38.	Draw the diagram to show the recombination of the spectrum of white light and label the following parts a) The ray of light that bends the most b) The ray of light that bends the least.	S2020 – 3
39.	Draw the schematic diagram of a biogas plant.	MQP2022–2
40.	Draw the ray diagram of image formed when the object is kept beyond 2F1 of the convex lens. With the help of the diagram, mention the position and nature of the image formed. (F1 : principal focus of the lens) **OR** Draw the ray diagram when of image formed the object is kept beyond C of the concave mirror. With the help of the diagram mention the position and nature of the image formed. (C : Centre of curvature of mirror).	MQP2022–3
41.	Draw the diagram of the arrangement of apparatus to show the electrolysis of water and label the 'graphite rod'.	MQP2022–2
42.	Draw the diagram of arrangement of the apparatus to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts. i) zinc granules ii) soap solution	MQP2022–3

43.	Draw the diagram showing the structure of nephron and label bowman's capsule.	MQP2022–2
44.	Draw the schematic diagram of an electric circuit comprising of electric cell, electric bulb, ammeter and plug key.	A2022–2
45.	Draw the ray diagram to show the image formation by a convex lens, when the object is kept at 2F1 of the lens. With the help of the ray diagram mention the position and nature of the image formed. [F1:Principal focus of the lens]	A2022–3
46.	Draw the diagram to show the arrangement of the apparatus used for testing the conductivity of salt solution and label 'graphite rod'.	A2022–2
47.	Draw the diagram of arrangement of the apparatus to show the reaction of zinc granules with dilute sulphuric acid and testing hydrogen gas by burning. Label the following parts i) Zinc granules ii) Delivery tube.	A2022–3
48.	Draw the diagram showing the structure of human excretory system and label 'urinary bladder'.	A2022–2
49.	Draw the diagram showing the longitudinal section of a flower and label 'ovary'.	A2022–2
50.	Draw the diagram showing the structure of the human brain and label the following parts : i) Cerebrum ii) Cerebellum.	A2022–4
51.	Draw the diagram showing the structure of closed stomata.	MQP–2023–1
52.	Draw the symbol diagram of two electric cells that are connected in series in an electric circuit.	MQP–2023–2
53.	Draw the ray diagram of image formation when the object is kept at 'C' of the concave mirror. With the help of the ray diagram mention the position and the nature of the image formed. (F: Principal focus of the mirror, C: Centre of curvature of mirror)	MQP–2023–3
54.	Draw the diagram of the arrangement of apparatus to show electrolysis of water.	MQP–2023–3
55.	Draw the diagram of the arrangement of apparatus to show the action of steam on metals. i) Metal piece ii) Delivery tube	MQP–2023–3
56.	Draw the diagram showing the structure of closed stomata.	MQP–2023–3
57.	Draw the diagram showing the structure of the human brain. Label the following parts. i) Cerebrum ii) Cerebellum	MQP–2023–3
58.	Draw the diagram of arrangement of apparatus to show that acid solution in water conducts electricity and label dilute HCl solution.	A2023–2
59.	Draw the ray diagram for the image formation in a convex lens when the object is placed beyond 2F1 . Mention the position and nature of the image formed. [F1: Principal focus of the lens]	A2023–2
60.	Draw the diagram of arrangement of apparatus to show the action of steam on a metal.	A2023–2
61.	Draw the diagram showing the structure of human brain. Label the following parts : i) Hypothalamus ii) Pons.	A2023–4
62.	Draw the diagram of arrangement of the apparatus used to show the action of steam on metal. Label the following parts : i) Metal sample ii) Delivery tube.	J2023–3
63.	Draw the diagram showing the structure of nephron and label 'glomerulus'.	J2023–4