MARKING SCHEME

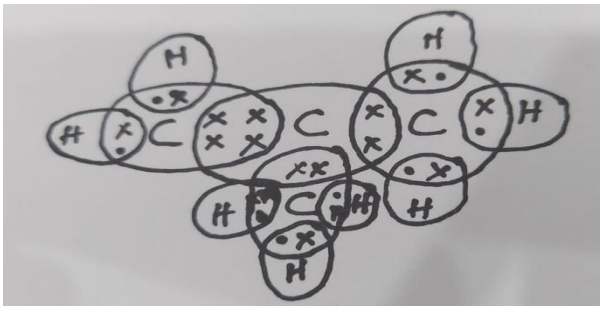
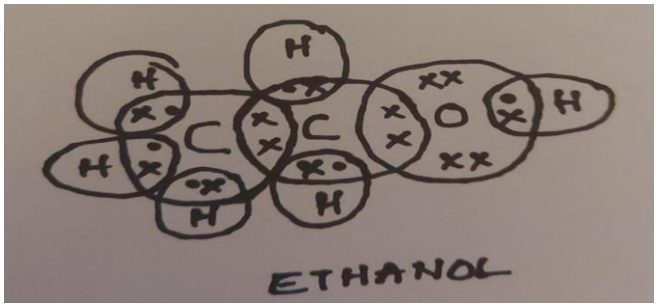
Of SQP SCIENCE (086)

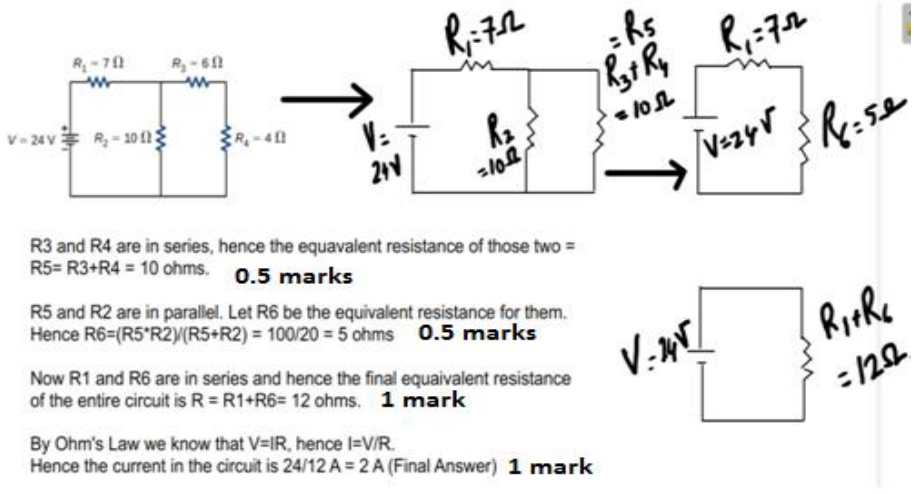
CLASS X

Term 2 (2021-22)

	SECTION - A	
1	a. P and R (½ + ½ Mark) b. Carbon has a valency four or Tetravalency & Catenation (½ + ½ Mark)	2
2	a. Y and Z (½ + ½ Mark) b. W is bigger, (½ Mark) Reason: Down the group number of shells increases (½ Mark)	2
3	a. Male gamete (sperm) travels in the female reproductive tract after being released. The path which it takes to fertilise the female gamete (egg) is vagina (½ Mark), uterus(½ Mark), fallopian tube(½Mark) resulting in a zygote; Alternatively accept the labelled figure of human female reproductive system indicating the passage of sperm from vagina (½ Mark) to uterus (½ Mark) and then to fallopian tube (½ Mark) for fertilisation resulting in a zygote; b. Zygote has 2 sets of chromosomes (½ Mark)/ alternatively accept 2n. No marks to be assigned for n or 3n.	2
4	a. The greenish black powdery mass on a stale piece of bread is due to bread mould *Rhizopus* (½ mark) which reproduces by spore formation (½Mark). b. Hyphae or thread like structures are the vegetative part (½ Mark) and tiny blob like structures or sporangia are the reproductive parts (½ Mark).	2
5	In field A, the reason for parental trait in consecutive generations of the offsprings is self-pollination. (1 mark) In field B, variation is seen to occur because of recombination of genes as cross - pollination is taking place. (1 Mark) **OR** Trait Y which exists in 70% (larger fraction) of the population, is likely to have arisen earlier because in asexual reproduction, identical copies of DNA are produced and variations do not occur. (1 mark) New traits come in the population due to sudden mutation and then are inherited. 70 % of the population with trait Y is likely to have been replicating that trait for a longer period than 5 % of population with trait X. (1 mark)	2
6	a. downwards (1mark)	2

	b. Because BC is in the same direction as the direction of field lines. Force is minimum when the direction of current in the conductor is the same as that of the magnetic field. BC will not contribute as the force on this part of the coil will be cancelled by the force on DA. (1mark) **OR** a. Relative closeness of field lines indicates the strength of magnetic field. Since field lines are crowded around the ends of the solenoid, hence these are the regions of strongest magnetism. (1mark) b. The direction of the field will also be reversed. (1mark)	
7	● DDT being a non- biodegradable pesticide will enter the food chain from the first trophic level i.e Plankton. (½mark) ● Non – biodegradable pesticides accumulate progressively at each trophic level. This phenomenon is known as biological magnification. (1mark) ● HAWK will have the highest level of pesticide. (½mark) **OR** A will represent more energy transfer as compared to C and E. (½mark) B will represent more energy transfer as compared to D. (½mark) When green plants are eaten by primary consumers, a great deal of energy is lost as heat to the environment, some amount goes into digestion and in doing work and the rest goes towards growth and reproduction. An average of 10% of the food eaten is made available for the next level of consumers. This loss of energy takes place at every trophic level. (1mark) Alternatively accept - In accordance with 10% law of transfer of energy in a food chain only 10% of energy available at one trophic level is transferred to the next trophic level.	2
	SECTION - B	
8	a. Silicon Reason: Tetrahedral structure **OR** Tetravalency or Four valeny and catenation **OR** Covalent bonding like carbon (½ + ½mark) b. Sodium Reason: It has 1 valence electron like Lithium (½ + ½ mark) c. Sulphur Reason: it forms oxides SO_2 and SO_3 (½ +½ mark)	3

9	a. Four (½ + 1 marks)  b. C_4H_8 and C_5H_{10} are homologues (½ mark) as they differ in ● "- CH_2-" ● differ in 14u molecular mass ● Same functional group ● Same general formula (½ + ½ mark) *(Any two reasons)* **OR** a. Ethanol; C_2H_5OH (1 + 1 marks)  b. CH_3OH and C_3H_7OH are homologues of ethanol (1 mark) **OR** CH_4O and C_3H_8O	3
10	Round green (½ mark): 30 (½ mark) Wrinkled yellow (½ mark) : 30 (½ mark) New combinations are produced because of the independent inheritance of seed shape and seed colour trait. (1mark)	3
11	a. E = P X T SO, E = 3X2 = 6 kWh (1 mark) Cost of buying electricity from the main electricity board = 6 x 3.50 = Rs. 21.0	3

	b. To reduce the boiling time using the same mains supply, the rate of heat production should be large. We know that $P= V^2/R$. Since V is constant, R should be decreased. Since R is directly proportional to l so length should be decreased. (2 marks)	
12	5 ohm, 10 ohm and R_1 are in series $1/R_p = 1/5+1/10+1/R_1$ $1/R_p = (2+1)/10 + 1/ R_1$ $= 3/10 +1/ R_1$ $1/R_p = (3 R_1 +10)/10 R_1$ $R_p= 10 R_1 / (3 R_1 +10)$ Now, 6 ohm, 6 ohm and R_p are in series Thus, $R_{eq} = 12 + 10 R_1 / (3 R_1 +10)$ ---------- (1) (1 mark) $V = I R_{eq}$ From the circuit $R_{eq} = 30/2 = 15$ A ----------(2) (1 mark) Equating (1) and (2) $12 + 10 R_1 / (3 R_1 +10) = 15$ $10 R_1 / (3 R_1 +10) = 3$ $10 R_1= (9 R_1 + 30)$ Thus, $R_1 = 30$ ohm. (1 mark) **OR**  (0.5+0.5+1+1)	3
13	a. Gas A is Ozone. *Alternatively accept the formula of the gas.* (½ mark) Ozone at the higher levels of the atmosphere is a product of UV radiation acting	3

	on oxygen (O_2) molecule. The higher energy UV radiations split apart some molecular oxygen (O_2) into free oxygen (O) atoms. These atoms then combine with molecular oxygen to form ozone. (1 mark) *Alternatively accept the following equations with the correct molecular formulae. No mark to be assigned if molecular formulae are not correct, when only the equation is written.* b. Ozone shields the surface of the earth / protects living organisms from ultraviolet (UV) radiation released by the sun. (½ mark) Chlorofluorocarbons (CFCs) (½ mark) which are used as refrigerants / in fire extinguishers (½ mark) lead to depletion of ozone layer.	
	SECTION - C	
14	a. Tt (1 mark) b. Traits like 'T' are called dominant traits, while those that behave like 't' are called recessive traits./Alternatively accept the definition of dominant and recessive traits with examples of T and t respectively /Alternatively accept the law of Dominance with examples of T and t. (1mark) c. Out of 800 plants 600 plants will be tall and 200 plants will be small (1 mark), 1 TT: 2Tt: 1tt (1 mark) **OR** In the cross between Tt X tt, 400 Tall (Tt) and 400 short (tt) plants will be produced. (1 mark) 1Tt:1tt (1 mark)	4
15	a. Sir is trying to demonstrate the principle of Electromagnetic induction. (1 mark) b. There will be induced current in the coil due to relative motion between the magnet and the coil. Changing the magnetic field around the coil generates induced current. (½ + ½ mark) c. Using a stronger magnet, using a coil with more number of turns. (2 marks) **OR** When the magnet moves into the coil, the ammeter shows a momentary deflection towards one side say left. (½ mark) When the magnet moves out of the coil, the ammeter shows a momentary deflection	4

	now towards right. (½ mark) This is due to changing magnetic field /flux associated with the coil as the magnet moves in and out. Alternatively, the flux increases when the magnet goes in and it decreases when the magnet goes out. (1mark)	