Strictly Confidential: (For Internal and Restricted use only)
Secondary School Examination-2020
Marking Scheme – SCIENCE
(SUBJECT CODE: 086) (PAPER CODE : 31/3/2)

General Instructions: -

1. You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.**Evaluation is a 10-12 days mission for all of us. Hence, it is necessary that you put in your best effortsin this process.**
2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. **However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks be awarded to them. In class-X, while evaluating two competency based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, marks should be awarded.**
3. The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
4. Evaluators will mark(√) wherever answer is correct. For wrong answer 'X"be marked. Evaluators will not put right kind of mark while evaluating which gives an impression that answer is correct and no marks are awarded. **This is most common mistake which evaluators are committing.**
5. If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
6. If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
7. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
8. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
9. A full scale of marks 0-80 has to be used. Please do not hesitate to award full marks if the answer deserves it.
10. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines).
11. Ensure that you do not make the following common types of errors committed by the Examiner in the past:-
    - Leaving answer or part thereof unassessed in an answer book.
    - Giving more marks for an answer than assigned to it.
    - Wrong totaling of marks awarded on a reply.

- Wrong transfer of marks from the inside pages of the answer book to the title page.
- Wrong question wise totaling on the title page.
- Wrong totaling of marks of the two columns on the title page.
- Wrong grand total.
- Marks in words and figures not tallying.
- Wrong transfer of marks from the answer book to online award list.
- Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.)
- Half or a part of answer marked correct and the rest as wrong, but no marks awarded.

12. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0)Marks.

13. Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.

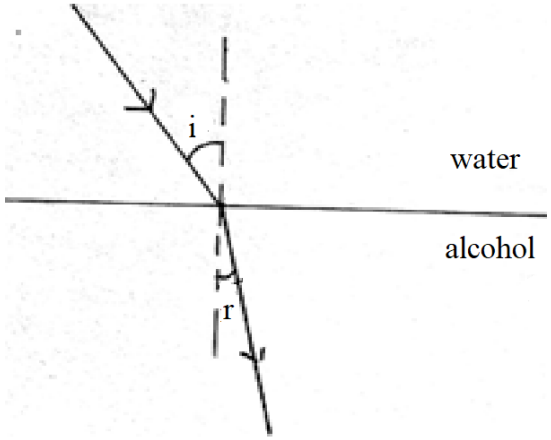
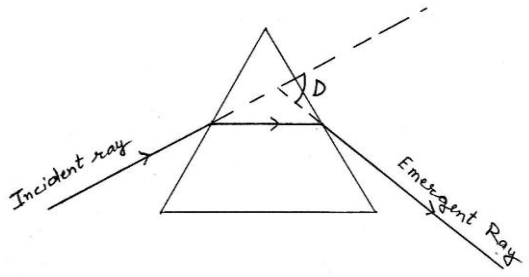
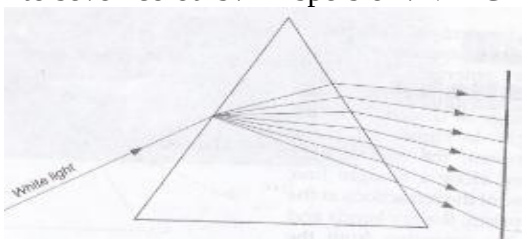
14. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

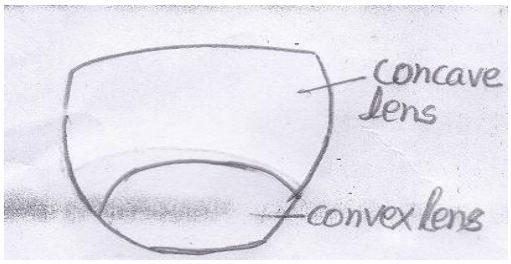
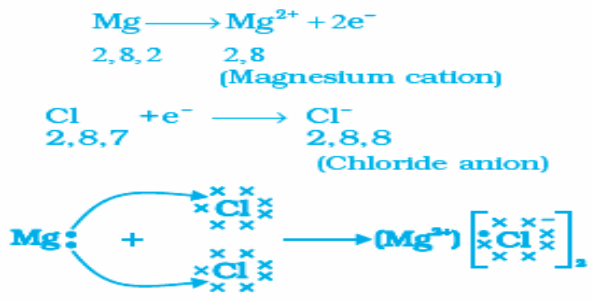
15. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

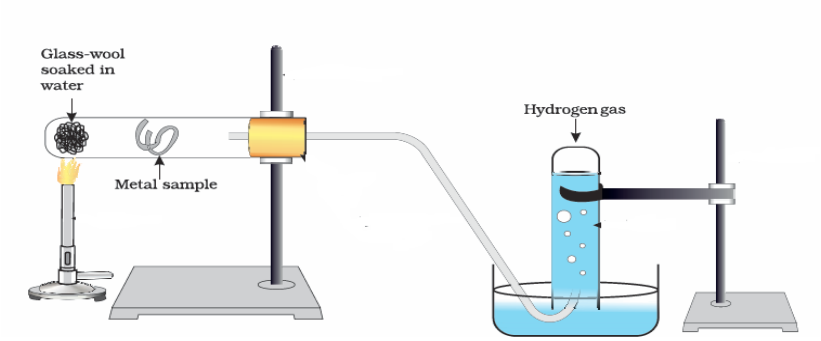
16. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

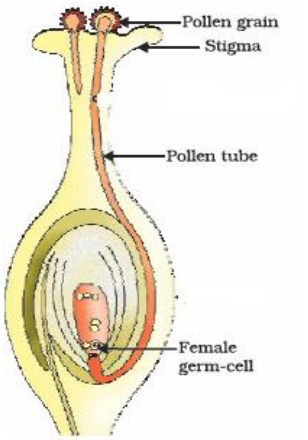
MARKING SCHEME –CLASS X SCIENCE (2019-20)			
QUESTION PAPER CODE : SET 31/3/2			
S.NO	**VALUE POINTS/EXPECTED ANSWER**	**MARKS**	**TOTAL MARKS**
	SECTION A		
1.	Tendency of an element to lose electrons. OR Atomic radii increases from Na to Cs due to addition of new shells.	1	1
2	Covalent bonds are formed by sharing of electron pair /pairs between two atoms.	1	1
3.	(a) She should monitor iodine intake in her diet. (b) During menstruation / during pregnancy and after going through menopause. (any two) (c) Low TSH level leads to swelling of neck region / disease called goiter. (d) Iodine	1 ½ ,½ 1 1	4
4.	(a) Hydropower is harnessed by converting the potential energy of falling water from a height into electricity. (b) It is the power developed when 10^6 J of work is done per second. / 1MW = 10^6 watts. (c) Loss of agricultural land / displacement of a large number of peasants and tribals/ destruction of ecosystem. (any two) (d) The blades of turbine move the armature of a generator with high speed to generate electricity.	1 1 ½, ½ 1	4
5.	(d) / Group 16 and Period 3 OR (d) / (A), (B) & (C)	1 1	1
6.	(c) / A has pH greater than 7 and B has pH less than 7.	1	1
7.	(b) / Formation of crystals by process of crystallisation.	1	1
8.	(c) / Lead storage battery manufacturing factories near A and soaps and detergents factories near B.	1	1
9.	(a) /This is an ideal setting of the Khadin system and A= catchment area; B= Saline area ; C=Shallow dugwell. OR (a) / biodiversity which faces large destruction.	1 1	1
10.	(a) / 2 Ω	1	1
11.	(c) / 2 A	1	1
12.	(a) / Scattering of light is not enough at such heights	1	1
13.	(c) / A is true but R is false.	1	1
14.	(a) / Both (A) and (R) are true and (R) is the correct explanation of the assertion.	1	1
	SECTION B		
15.	(i) $2NaOH_{(aq)} + Zn_{(s)} \rightarrow Na_2ZnO_{2(aq)} + H_{2(g)}$ (ii) $CaCO_{3(s)} + H_2O_{(l)} + CO_{2(g)} \rightarrow Ca(HCO_3)_{2(aq)}$ (iii) $HCl_{(aq)} + H_2O_{(l)} \rightarrow H_3O^+_{(aq)} + Cl^-_{(aq)}$	1 1 1	

	Note : Deduct half marks if equations are not balanced. OR (i) $G = Cl_2$ $C = CaOCl_2$ (ii) $Ca(OH)_2 + Cl_2 \rightarrow Ca\ OCl_2 + H_2O$ (iii) Common name – Bleaching Powder Chemical name – Calcium Oxychloride **Note :** Give full credit for writing common name only	 ½ ½ 1 1	 3
16.	(i) White to grey Reason : Silver chloride decomposes to produce silver and chlorine. (ii) Brown to black Reason : Copper oxide is produced on heating. (iii) Blue to colourless Reason : Zinc Sulphate is formed.	½ ½ ½ ½ ½ ½	 3
17.	(a) X > Y > Z (b) Z; needs only one electron to attain stable configuration (c) (i) X_2Y_3 (ii) XZ_3	1 ½, ½ ½ ½	 3
18.	(a) (i) Enzyme trypsin : Helps in the digestion of proteins. (ii) Enzyme lipase : Helps in the breaking down of emulsified fats. (b) Two functions : • Increase the surface area . • Helps in absorption of digested food. (Note : Full credit for the statement : Increase the surface area for the absorption of digested food).	1 1 ½ ½	 3
19.	(a) Ecosystem : It is the interaction between living / biotic and non-living / abiotic components in an area / environment. (b) Because autotrophs have the ability to trap solar energy and convert it into food by photosynthesis and transfer food energy to the next level in a food chain. (c) Frogs : Third Trophic level ; Secondary consumers OR (a) High energy UV radiations split apart some molecular oxygen into free (O) atoms, these atoms combine with molecular oxygen to form ozone. (b) $O_2 \xrightarrow{UV} O + O$ $O + O_2 \rightarrow O_3$ (Ozone) (c) • Depletion of the ozone layer. • If these UV radiations reach the earth they may cause skin cancer in human beings.	1 1 ½, ½ ½ , ½ ½ , ½ ½ , ½	 3
20.	Three factors :- 1. Natural Selection 2. Genetic Drift 3. Geographical Isolation 4. Mutations (any three)	 ½ × 3	

	• Geographical Isolation • because pollination is ocurring in the same plant which does not bring much variations leading to no evolution .	½ 1	3
21.	(a) (i) Green (ii) 25 % (iii) GG : Gg 1 : 2 (b) The traits which are expressed in F_1 progeny are called dominant traits, whereas the traits which are unable to express themselves in F_1 progeny but reappear in the F_2 progeny are called recessive traits.	½ ½ 1 ½ ½	3
22.	(a) Alcohol is optically denser medium. Reason : A medium having higher refractive index is an optically denser medium. (b)  (c) Angle of incidence is greater than angle of refraction / $\frac{\sin i}{\sin r}$ = constant	½ ½ 1 1	3
23.	(a)  Path of the ray Labelling (b) Splitting into seven colours / Dispersion / VIBGYOR /  **Note :** Marks may also be awarded if answer is given in the form of a figure.	 1 1 1	

	OR (a) (i) Bifocal Lens (ii) Upper part of lens is concave and lower part of the lens is convex. /  (b) P = +3D $f = \frac{1}{P}$ $= \frac{1}{3}$ m $= \frac{+100}{3}$ cm = + 33.3 cm P = - 3D $f = \frac{-100}{3} = -33.3$ cm	½ ½, ½ ½ ½ ½	3
24.	(i) The strength of magnetic field is higher near the poles /ends of solenoid. (ii) A current carrying solenoid behaves as a bar magnet. (iii) If a fuse , with a defined rating , is replaced by one with a larger rating then the fuse wire will not burn even when a current greater than safe limit is flowing. As a result the electrical circuit / appliances will be damaged.	1 1 1	3
	SECTION C		
25	(i) $2HgO \xrightarrow{Heat} 2\,Hg + O_2$ (ii) $2Cu_2\,O + 2Cu_2S \xrightarrow{Heat} 6Cu + SO_2$ (iii) $3MnO_2 + 4\,Al \rightarrow 2Al_2O_3 + 3Mn$ +heat (iv) $Fe_2O_3 + 2\,Al \rightarrow Al_2O_3 + 2Fe$ + heat (v) $ZnCO_3 \xrightarrow{Heat} ZnO + CO_2$ (Note : Deduct ½ marks if equations are not balanced.) OR (i)  	1 1 1 1 1 ½ ½ 1	

	(ii) In ionic compounds , very strong forces of attraction exist between positive and negative ions. (iii)  Diagram Any two labelling	1 1 ½ , ½	 5
26.	(a) (i) $CH_3CH_2OH \xrightarrow[H_2SO_4]{\text{hot conc.}} CH_2 = CH_2 + H_2O$ (ii) $CH_3CH_2OH \xrightarrow[\text{or acidified } K_2Cr_2O_7 + \text{ Heat}]{\text{Alkaline } KMnO_4 + \text{ Heat}} CH_3COOH$ (b) Addition Reaction: Unsaturated hydrocarbons add hydrogen in the presence of catalysts to give saturated hydrocarbons. Example -  (or any other example) Substitution Reaction: One type of atom or a group of atoms takes the place of another in a compound. Example- $CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$ (in the presence of sunlight)	1 1 1 , 1 ½ , ½	 5
27.	(a) • Oxygen and CO_2 produced during photosynthesis and respiration is given out through stomata in the leaves. • Excess water is given out by the process of transpiration. • When leaves become old, they fall off carrying waste materials along with them in their vacuoles. (Any Two) (b) Structure of Nephron :- Nephron is the basic filtration unit in the kidney which is made of fine tubules, one end of which forms a cup-shaped structure called Bowman's capsule, and the other end opens into a collecting duct/tube.	 1,1 1½	

	Function of Nephron :- Blood carrying nitrogenous wastes is filtered through the glomerulus and is collected in the Bowman's capsule, some useful substances in the filtrate like glucose and water etc are selectively reabsorbed as the filtrate flows along the tube.	1½	5
28 .	(a)  Drawing Four Labellings (b) Pollen tube carries the male germ cell to reach the ovary and fuse with the female germ cell. (c) (i) Seed ← Ovule (ii) Fruit ← Ovary OR (a) Two reasons : • Avoids unwanted/undesirable pregancies/ STD's • Use of condom prevents the transmission of infections from one person to another. (b) Oral contraceptives change the hormonal balance of the body so that the eggs are not released. (c) Sex selective abortion is a procedure that is done for female foetuses / female foeticide. It adversely affects the male-female sex ratio.	1 ½ × 4 1 ½ ½ 1 1 1 1 1	5

29.	(a) Power is defined as rate of doing work/ rate at which energy is consumed/ rate at which electric energy is dissipated in an electric circuit. S.I unit of Power is watt (b) (i) P = VI = 5 volt × 500 mA = 5 volt × $\frac{500}{1000}$ A = 2.5 watt (ii) $P = \frac{V^2}{R}$ or $R = \frac{5 \text{ volt X } 5 \text{ volt}}{2.5 \text{ watt}}$ $R = \frac{250}{25} = 10\Omega$ (iii) Energy Consumed = Power × Time = 2.5 W × 2.5h = 6.25 Wh	1 1 ½ ½ ½ ½ ½ ½	5
30.	(a) It is a convex mirror.So focal length should be positive. Radius of curvature R= + 5 m ∴ focal length $f = \frac{5}{2} = +2.5$ m Object distance u= -20m Mirror formula $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ $\frac{1}{v} + \frac{1}{-20} = \frac{1}{2.5}$ $\frac{1}{v} = \frac{1}{20} + \frac{1}{2.5}$ $\frac{1}{v} = \frac{1}{20} + \frac{10}{25}$ $\frac{1}{v} = \frac{5+40}{100} = \frac{45}{100}$ $v = \frac{100}{45} = \frac{20}{9} = +2.2$m • Nature of image = virtual and erect image • Size of image : diminished image	½ 1 ½ 1 ½ ½	

	(b) Concave Mirror Reason : to obtain erect and enlarged image of teeth	½ 1	
	OR		
	(i) Convex lens to get a magnified image of the lines on the palm. (ii) Between F and 2F of the lens / or at F of the lens (iii) focal length f = +10 cm object distance u = -5 cm	1 1	
	Lens formula $\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$	½	
	$\frac{1}{v} - \frac{1}{-5} = \frac{1}{10}$	1	
	$\frac{1}{v} + \frac{1}{5} = \frac{1}{10}$ $\frac{1}{v} = \frac{1}{10} - \frac{1}{5} = \frac{1-2}{10}$ $\frac{1}{v} = \frac{-1}{10}$		
	$v = -10$ cm	½	
	• $m = \frac{h_{image}}{h_{object}} = \frac{v}{u}$ $= \frac{-10}{-5} = 2$	½	
	Size of image is 2 times the size of object.	½	5