Strictly Confidential: (For Internal and Restricted use only)
Secondary School Examination-2020
Marking Scheme – SCIENCE
(SUBJECT CODE: 086) (PAPER CODE : 31/5/2)

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.

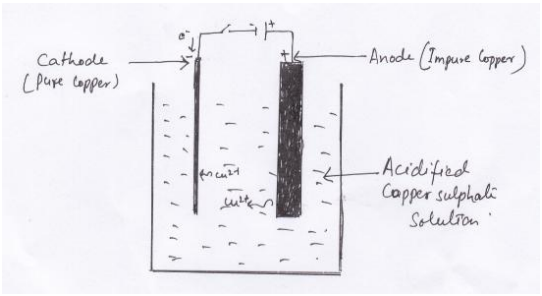
15. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

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.

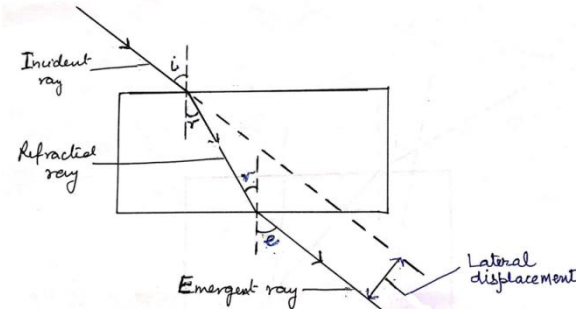
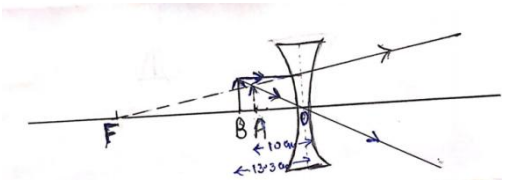
MARKING SCHEME – CLASS X SCIENCE(2019-20)			
QUESTION PAPER CODE : 31/5/2			
S.NO	**Value Points/Expected Answer**	**MARKS**	**TOTAL MARKS**
	SECTION A		
1.	All are metalloids/Shows the properties of metals and non-metals OR Properties of elements are a periodic function of their atomic number	1	1
2.	No charged particles/ions	1	1
3.	(a) Thyroid stimulating hormone. (b) It stimulates / regulates thyroid gland to produce thryroid hormone or thyroxine. (c) Because high and low TSH level may increase the chances of miscarriage. (d) Proper medication is required.	1 1 1 1	4
4.	(a) Cells which convert solar energy to electrical energy/electricity (b) Voltage – 0.5 to 1V Electricity –0.7W (c) India receives great amount of solar energy throughout the year. (d) Advantages :- No moving parts/require little maintenance /work quite satisfactorily without any focusing device/can be set up in remote and inaccessible areas. (Any Two)	1 ½ ½ 1 ½ + ½	4
5.	(A) / 5A	1	1
6.	(C) / remains unchanged	1	1
7.	(B) / 10^{-3}A and 10^{-6} A respectively	1	1
8.	(B)/ Chipko Movement	1	1
9.	(D) /I ,II and III OR (D) / Reduce	1	1
10.	(B) / XY_2 OR (B) / (C) Group 16 and period 3 /Group 17 and period 3 (Note- Both are correct, marks to be awarded for any one)	1	1
11.	(B) / Decomposition & Redox	1	1
12.	(C)/ Green	1	1
13.	(ii) / Both (A) and (R) are true, but (R) is not the correct explanation of the assertion(A)	1	1
14.	(iv) / (A) is false, but (R) is true	1	1
	SECTION-B		
15.	(a) Anode- Oxygen Cathode- Hydrogen (b) Because one molecule of water contains two atoms of hydrogen and one atom of oxygen/ $2H_2O \rightarrow 2H_2+O_2$ (c) Electrolysis of water will not take place OR	1 1 1	

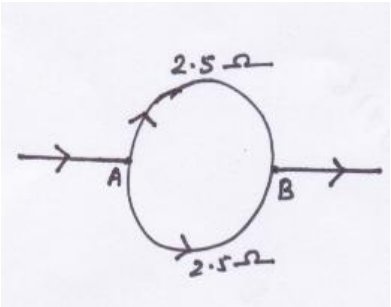
	(a) Chemical Name – Sodium Carbonate decahydrate Common Name – Washing Soda Chemical Formula - $Na_2CO_3 . 10H_2O$ (b) $NaCl + H_2O + CO_2 + NH_3 \rightarrow NH_4Cl + NaHCO_3$ $2NaHCO_3 \xrightarrow{Heat} Na_2CO_3 + H_2O + CO_2$ $Na_2CO_3 + 10H_2O \rightarrow Na_2CO_3 . 10H_2O$ (c) It helps in removing permanent hardness./ It forms insoluable Ca or Mg salts in the form of scum	½ ×3 1 ½	3
16.	(a) 'M' is magnesium /Mg 'N' is Magnesium oxide / MgO (b) $2Mg + O_2 \rightarrow 2MgO$ (c) 'M' undergoes oxidation because oxygen is added to it/ Loss of 2 electrons	½ ½ 1 ½ +½	3
17.	<table><tr><td></td><td>Mendeleev's Periodic Table</td><td>Modern Periodic Table</td></tr><tr><td>1</td><td>Based on atomic mass of elements</td><td>Based an atomic number of elements</td></tr><tr><td>2</td><td>It has 8 groups</td><td>It has 18 groups</td></tr><tr><td>3</td><td>Except 8th group all groups are divided in A & B sub groups</td><td>No sub groups</td></tr><tr><td>4</td><td>Two or more elements are placed in the same group</td><td>Each element is placed in separate group</td></tr><tr><td>5</td><td>Some elements with higher atomic mass are placed before elements with lower atomic mass</td><td>No such anomalies</td></tr><tr><td>6</td><td>No place for isotopes</td><td>Isotopes find place in it</td></tr><tr><td colspan="3">(Any two)</td></tr></table> (b) Example – Li , Na , K The atomic mass of the middle element is an average of the atomic masses of other two elements. (Or any other example) (c) Properties of elements are a periodic function of their atomic number	½ ×2 ½ ½ 1	3
18.	(a) Exchange of gases. (b) Because amount of oxygen dissolved in water is fairly low as compared to the air (c) (i) Pyruvate (ii) Carbon dioxide	1 1 ½ ½	3
19.	• Trophic level - Each step or level of a food chain forms a trophic level • Grass → Insect → Frog →Snake/Hawk / Correct Diagram (any other) • Because it moves progressively through the various trophic levels and	1 1	

	is no longer available to the previous level from producers to consumers. OR (i) Aquatic (ii) Abiotic (iii) Air/Water/Soil/Temperature /Non-living (iv) Living organism/plants and animals (v) Definition – All the interacting organisms in an area together with the non living constituents of the environment form an ecosystem /interaction between biotic and abiotic components.	1 ½ ½ ½ ½ 1	3
20.	(a) • Secretions from seminal vesicle. • 22+X and 22+Y (b) (i) Female-XX (ii) Male – XY	 1 ½ + ½ ½ ½	3
21.	(a) Speciation- The origin of a new species from the pre existing one. (b) Natural selection – Nature selects the best traits in a species , leading to survival of the fittest and evoloution of species. (c) Genetic drift – Accidental changes in the frequency of genes.	1 1 1	3
22.	The top part of the mirror is concave because it forms enlarged ,erect and virtual image when the object is closer to the mirror. The middle part is a plain mirror because it forms image of the same size. The lower part is a convex mirror because it forms erect and diminished image.	½ + ½ ½ + ½ ½ + ½	3
23.	(a) Myopia/Short sightedness (b) Concave/Diverging lens. (c) • Excessive curvature of eye lens • elongation of eye ball (d) $P(D) = \frac{1}{f(m)}$ $P(D) = \frac{1}{-2.5(m)} = \frac{10}{-25} = \frac{2}{-5} = -0.4D$ (Deduct ½ mark if unit is not mentioned) OR (a) The Red colour is least scattered by fog or smoke, hence visible from a long distance. (b) Because in the absence of atomosphere there is no scattering of light. (c) Because of atmospheric refraction, the sun appears above the horizon even after actual sunset.	½ ½ ½+ ½ 1 1 1 1	3
24.	(a) (i) Momentary deflection in the needle of the galvanometer to the left / right. (ii) Momentary deflection in the needle of the galvanometer but in the opposite direction. (iii) No deflection (b) Electromagnetic induction. (c) Motion of a magnet with respect to coil induces an electric current in the coil which lasts so long as the motion is taking place / change in magnetic field around a coil produces an induced current in it.	 ½ ½ ½ ½ 1	3

	SECTION C		
25	(a) –OH group /Alcoholic group ; CH_3-CH_2-CH_2-OH	½ + ½	
	(b) – COOH / $-\overset{O}{\overset{\|}{C}}-OH$ / Carboxylic acid ; CH_3 –CH_2-COOH	½ + ½	
	(ii) • No • Because they have different molecular formula.	½ ½	
	(iii) Propanoic acid is formed	½	
	• $CH_3CH_2CH_2OH \xrightarrow[\Delta]{\text{Alk .KMn O}_4} CH_3CH_2COOH$	1	
	• Oxidising agent.	½	5
26.	For ore X →Calcination/ Heating in limited supply of air/absence of air.	½	
	$ZnCO_3(s) \xrightarrow{heat} ZnO(s)+CO_2(g)$	1	
	For Ore Y→ Roasting/Heating in excess of air.	½	
	$2ZnS(s) + 3O_2(g) \xrightarrow{heat} 2ZnO(s)+2SO_2(g)$	1	
	The metal oxide is reduced by using suitable reducing agent such as carbon. $ZnO(s) + C(s) \rightarrow Zn(s) + CO(g)$	1 1	
	(Note – Any other example can be taken) OR		
	(a)Figure  	1	
	• Impure copper is made the anode and thin strip of pure copper is made the cathode. • A solution of acidified copper sulphate is taken as electrolyte (Note : Labelled diagram is to be awarded full marks)	½ ½	
	On passing the current the pure metal from the anode dissolves into the electrolyte and equivalent amount of pure metal is deposited on the cathode.	1	
	(b) • By filling the gaps with molten iron formed in the reaction of Fe_2O_3 with aluminum powder.	½	

	• Thermit process/reaction • $Fe_2O_3(s)+2Al(s) \rightarrow 2Fe(l)+Al_2O_3(s)+Heat$	½ 1	5
27.	(a) • A→Ureter • B→ Seminal Vesicle • C→Urethra • D→ Vas deferens (b) Testosterone : Role • Regulates the formation of sperms • Changes in appearance of boys at the time of puberty. (c) Function of 'B' • Providing nutrition and transportation to sperms. Function of 'C' • Serves as a common passage to both sperms and urine. OR (a) • Regeneration- the lost body part can be regenerated. • Budding – a complete small individual develops on the parent body during favourable conditions. • Spore Formation – Spores are covered with thick wall that helps to overcome unfavourable conditions. (b) Buds produced in the notches along the leaf margins develop into new plants. (c) Advantages : • Propagation of flowerless plants. • Genetically similar to the parent plant. • Plants raised by vegetative propagation bear flowers and fruits earlier than those produced from seeds. (Any two)	½ ½ ½ ½ 1 ½ +½ ½ ½ ½ + ½ ½ + ½ ½ + ½ 1 ½ + ½	5
28.	• Take a potted plant with variegated leaves. • Keep the plant in a dark room for three days so that all the starch gets used up. • Keep the plant in sunlight for about six hours. • Pluck a leaf from this plant. Mark the green areas in it and trace them on a sheet of paper. • Dip the leaf in boiling water for a few minutes. • After this, immerse it in a beaker containing alcohol. • Carefully place the above beaker in a water-bath and heat till the alcohol begins to boil. • Now dip the leaf in a dilute solution of iodine for a few minutes. • Take out the leaf and rinse off the iodine solution. Observation: The green parts of the leaf have turned blue –black. Inference : This indicates the presence of starch formed during photosynthesis.	½ ×8 ½ ½	5

29.	(a) .  (Note –Deduct ½ mark if arrows are not shown)	2	
	(b) $n_{ga} = \frac{\text{Speed of light in air}}{\text{Speed of light in glass}} = \frac{3\times10^8}{2\times10^8} = \frac{3}{2} = 1.5$	½, ½, ½	
	(c) f (m) $= \frac{1}{\text{P (D)}}$ $f = \frac{1}{P} = \frac{1}{-2.5D} = \frac{-10}{25D} = -0.4m$ (Note –Deduct ½ marks if unit is not mentioned)	½ ½ + ½	
	OR		
	(a) $f(m) = \frac{1}{P(D)}$	½	
	$f = \frac{1}{-2.5D} = \frac{-10}{25D} = -0.4m = -40cm$	1	
	f=-40cm v =-10cm		
	$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$	½	
	$\frac{1}{-10\text{ cm}} - \frac{1}{u} = \frac{1}{-40\text{ cm}}$		
	$-\frac{1}{u} = \frac{1}{-40} + \frac{1}{10}$	½	
	$= \frac{-1+4}{40} = \frac{3}{40}$		
	$\therefore u = -\frac{40}{3} = -13.3$ cm	1	
	(b) Since the power is –ve , the lens used is concave / diverging	½	
	 	1	

	OA = v = -10cm ; OB = u =-13.3 cm ; OF = f = -40cm		5
30.	(a) The potential difference ,V , across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it, provided its temperature remains the same.	1	
	(b) In Series	½	
	(c) Energy Consumed = P× t	½	
	= $100W \times 60s$		
	6000J	1	
	(d) 		
	$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2}$	½	
	$R_1 = 2.5\Omega$; $R_2=2.5\Omega$		
	$\therefore \frac{1}{R} = \frac{1}{2.5} + \frac{1}{2.5} = \frac{2}{2.5}$	1	
	$or\ R = \frac{2.5}{2} = 1.25\Omega$	½	5
	(Deduct ½ marks if unit is not mentioned)		