Secondary School Examination-2020
Marking Scheme – SCIENCE
(SUBJECT CODE: 086) (PAPER CODE : 31 (B))

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 (2019-2020)

S.NO	Value Points/ Expected Answers	Marks	Total Marks
	QUESTION PAPER CODE <u>31 (B)</u>		
1	Covalent Bond/ single covalent bonds	1	1
	OR		
1	Ethene ; C_2H_4 ,	½+½	1
2	Ethyl alcohol / ethanol ; C_2H_5OH / CH_3CH_2OH	½+½	1
3	(a) $CaCO_3$	1	1
	(b) $NO_2/SO_2/CO_2/SO_3$ (any two)		
	OR		
	(b) CO_2 / Carbon dioxide	½+½	1
	(c) (B) / 5.5	1	1
	(d) (B) / its electronic configuration is (2,8.8,2)	1	1
4	(a) It is the energy harnessed from the heat of the earth	1	1
	(b)		
	* Cost of production is not much		
	* Always available	½+½	1
	(or any other) (any two)		
	(c) It is used to rotate armature in a magnetic field to produce electricity/ electric energy	1	1
	(d)* Electromagnetic induction	½	1
	* In an electric generator mechanical energy is used to rotate a conductor in a magnetic field to produce electricity (any other suitable definition)	½	
5	On heating alcohol in presence of alkaline potassium permanganate or acidified potassium dichromate, acetic acid is formed		
	/CH_3CH_2OH $\xrightarrow{\text{alkaline}KMnO_4 + \text{Heat}}$ CH_3COOH Ethanol Acidic Acid or acidified $K_2Cr_2O_7$ + heat	1	1
6	Alcohol - Propanol / C_3H_7OH/ $CH_3CH_2CH_2OH$	½	
	Carboxylic acid - Ethanoic acid / CH_3COOH	½	1
	OR		
	Ethanol/ C_2H_5OH and sodium acetate / CH_3COONa are formed		
	/ $CH_3COOC_2H_5$ $\xrightarrow{\text{NaOH}}$ $C_2H_5OH+CH_3COONa$	1	1

	(Marks can be alloted for equation also)		
7	(C) / spinal cord	1	1
8	(D) / CH_4	1	1
9	(B) / Cropfield	1	1
10	(A) / Stored in body tissues	1	1
11	(C) / Resources	1	1
12	(C) / Involve the local community in forest conservation efforts	1	1
13	(b) both (A) & (B) are true , but (R) is not correct , explanation of the assertion (A)	1	1
14	(d) A) is false but (R) is true.	1	1
15	(a) Addition reaction- when two or more substances combine to form single compound / Exothermic reaction : Reaction in which heat is released (b) $CaO + H_2O \rightarrow Ca(OH)_2$ (c) i) Calcium oxide / quick lime reacts vigorously with water. ii) Large amount of heat is released	½+ ½ 1 ½ ½	3

16	* Properties of elements are a periodic function of their atomic number
	
	   * No of groups - 18
	   * No of periods - 7
	   * Period- 3rd , valency - 2
		1
		
		 ½
		 ½
		 ½+½
			3

17	* Green leaves / green stem/ green parts of plant
	 * Chloroplast
	 * (i) CO_2 / carbon dioxide - obtained from atmosphere
	    (ii) H_2O / water - obtained from soil / earth
	
	                    OR
	
	 * During respiration , glucose combines with oxygen in the cells and provide energy (heat)
	 * $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + energy$
	 (glucose)
	
	 Breathing is a process by which organism obtain oxygen from the environment and release carbon dioxide whereas respiration is the process of oxidation of food and release of energy
	                    /
	 Breathing is a physical process whereas respiration is a bio-chemical process
		½
		 ½
		 ½+½
		 ½+½
		
		 1
		
		 1
		
		 1
			3
			
			 3

18				

Blood Vessels	Function		
1. Arteries	They carry blood away from the heart to various organs of the body.	1	3
2. Veins	They collect the blood from different organs and bring it back to the heart.	1	
3. Capillaries	They help in exchange of material between blood and surrounding cells.	1	

19	* Pollination is transfer of pollen grains from stamen/ anther to stigma * Bird/ insect/ water/ wind/ animal (any two) * After the pollen land on stigma, Pollen tube grows then it reaches to ovary where female germ cell is present to form zygote. OR (a) i)Fertilisation takes place / fusion of male and female gametes takes place/ forms fruit after fertilisation ii) Pollen grains lands on stigma / stigma receives pollen grains iii) It forms /produces pollen grains (b) Petals / sepals / stamen / style / stigma (any three)	1 ½ +½ 1 ½ ½ ½ ½*3	3

20	* Placenta is a disc which is embedded in the uterine wall . It is a special type of tissue which gives nutrition to the embryo through mother's blood. *It provides nutrition/ glucose/ transport oxygen from mother's blood/ remove water substances (any two)	1 1+1	3

21	(a) It is a point on principal axis of a concave mirror, where light rays incident parallel to the principal axis intersect after reflection * between 0-12 cm / less than 12 cm (b) * image formed is erect * diminished /wider field of view/ it covers much larger area of the traffic behind for a driver to see	1 1 ½ ½	3

| 22 | u= -30 cm <br> f=-20 cm ,

 $$\frac{1}{f}=\frac{1}{v}+\frac{1}{u}$$
 $$\frac{1}{-20}=\frac{1}{v}+\frac{1}{(-30)}$$
 $$\frac{1}{v}=\frac{1}{-20}+\frac{1}{30}, \quad =\frac{-3+2}{60}=\frac{-1}{60}$$
 V= -60 cm
 Position of image is at 60 cm in front of the mirror

 $$m=\frac{-v}{u}=\left(\frac{-60}{-30}\right)$$
 $$= -2$$

<center>OR</center>
 u= -18 cm , f = +12cm

 $$\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$$

 $$\frac{1}{12}=\frac{1}{v}-(\frac{1}{-18})$$

 $$\frac{1}{v}=\frac{1}{12}-\frac{1}{18}$$
 v= 36 cm
 $$m=\frac{v}{u}$$
 $$=\frac{36}{-18}= -2$$ | ½

 1

 ½

 ½
 ½

 ½

 ½

 ½

 ½

 ½

 ½ | 3 |
| 23 | * A coil of many circular turns of insulated copper wire wrapped closely in the shape of a cylinder is called a solenoid.

 * It indicates that magnetic field is the same at all points inside the solenoid / magnetic field is uniform inside the solenoid

 * The magnetic field produced inside solenoid can be used to magnetise a piece of magnetic material when placed inside the coil/ by placing magnetic material inside the solenoid. | 1

 1

 1 | 3 |

24	* Overloading is caused by connecting too many appliances to a single socket/ overloading is caused by an accidental hike in the supply voltage	1	
	* Short circuiting : It is caused when a live wire and the neutral wire come into direct contact, current in the circuit abruptly increases	1	3
	* Earth wire protects from severe electric shock when there is a leakage of current / Earth wire provides low Resistance conductivity path for the current	1	
25	(a) * Hydrogen gas/ H_2 * It burns with pop sound	½ ½	

	(b) (a) $Zn + 2HCl \rightarrow ZnCl_2 + H_2 \uparrow$
	    Salt : Zinc chloride
	    (b) $Zn + 2NaOH \rightarrow Na_2ZnO_2 + H_2 \uparrow$
	    Salt : sodium zincate
		½ x4	5

	(c) Acid : HCl / Hydrochloric acid
	    Base : NH_4OH / Ammonium hydroxide
	    Nature : Acidic
	    pH value : less than 7
		½ x4	

	OR		

	(a) * Acid - HCl (hydrochloric acid)
	     Base - NaOH (Sodium hydroxide)
	     Formula - NaCl
	     Chemical Name - Sodium Chloride
	     Source- Sea Water/ Ocean
		½
		 ½
		 ½
		 ½
		 ½	

	(b) *Deposits of solid sodium chloride/ common salt in the form of large crystals * brown ; color is due to impurities	½ ½+½	
	(c) It decomposes to form sodium hydroxide, chlorine and hydrogen * $2\ NaCl + 2H_2O \rightarrow 2NaOH + Cl_2 + H_2$	½ ½	
26	(a) Cinnabar is an ore of mercury/ HgS * when cinnabar is heated in air it converts into mercuric oxide (HgO), It is reduced to mercury on further heating. / $2HgS + 3O_2 \xrightarrow{heat} 2\ HgO + 2SO_2$ $2HgO \xrightarrow{heat} 2Hg + O_2$	1 1+1	5

	(b) * An alloy is the homogeneous mixture of two or more metals, or a metal and a non- metal.
	* Advantages : * To increase hardness of metal in an alloy
	         * To increase resistance of metal
	         * To decrease melting point of metal (soldering)
	       (any other point) (any two)
		1
		
		½+½	

27	These are chemical substances which are secreted from different parts of the plant * Auxin - help in growth of cells * gibberellin - growth of stem * cytokinin- promote cell division * Abscisic Acid - inhibit growth/ wilting of leaves OR (a) Pituitary gland : Growth hormone- It regulates growth and development of body(any other piluitary hormone) Adrenal gland : Adrenalin - It increases heart beat/ increases breathing rate (b) Feed back mechanism regulates the secretion of quantities of hormones. It also regulate the time of secretion. Example: If sugar level in blood rises, it is detected by the pancreas cells, consequently so it produces more insulin. As the sugar level falls the insulin secretion is reduced.	1 ½+½ ½+½ ½+½ ½+½ 1½ 1½ 1 1	5 5
28	(a) i) Homologous organs: The organs which have similar basic structures, but perform different functions. Examples : limbs of birds, reptiles and amphibians (or any other suitable example) ii) Analogous organs : The organs which have different basic structures but perform similar functions . Example: Wings of bat and wings of bird (or any other suitable example) Iii) Fossils: Preserved traces of living organisms of past..Example: Fossils of Ammonite/ Trilobite/ Dinosaur/ Skull (Rajasaurus) (Any one) (b)Two methods (i) Relative method by digging / the fossils found closer to the surface are more recent than the fossils in the deeper layers. (ii) By detecting the ratio of different radioactive isotopes of the same element in the fossil material/ carbon dating.	½+½ ½+½ ½+½ 1+1	5
29	(a) Myopia Causes: 1. Excessive curvature of the eye lens 2. elongation of eye ball	1 1 1	

	Correction			5
	Using concave lens of suitable power which brings the image on retina	½		
	(b) *It is due to less scattering of red coloured light.	½		
	* No	½		
	* There is no atmosphere around the moon, so scattering of light does not take place	½		
30	Series	Parallel	½+½	5

Series

a) $R = 10\,\Omega + 40\,\Omega = 50\,\Omega$

$I = \dfrac{v}{R}$

$I = \dfrac{5}{50} = \dfrac{1}{10} = 0.1\ A$

$I_A = 0.1\ A$

$I_B = 0.1\ A$

Ratio $\dfrac{I_A}{I_B} = 1$

Parallel:

$I_{A} = \dfrac{5}{10} = 0.5A$

$I_B = \dfrac{5}{40} = \dfrac{1}{8} = 0.125\ A$ ½

$\dfrac{I_A}{I_B} = \dfrac{0.5}{0.125}$ ½

Ratio : 4:1   ½+½

Series
(b
$V_A = 0.1 \times 10 = 1V$
$V_B = 0.1 \times 40 = 4V$

$\dfrac{V_A}{V_B} = \dfrac{1}{4}$

Parallel

$\dfrac{V_A}{V_B} = 1$ ½+½

c)
$H = I^2 Rt$
$= (0.1)^2 \times 50 \times 1$ ½
$= 0.5\ J$ ½

OR

(a)* The amount of work done in moving a unit charge from one point to the other point   1
SI Unit - volt   ½
(b)
I) Electric cell   ½
II) Rheostat   ½

(c) $R_S = R_1 + R_2 + R_3$ ½
Highest in series = 20+30+60 = 110 Ω ½

$\dfrac{1}{R_p} = \dfrac{1}{R_1} + \dfrac{1}{R_2} + \dfrac{1}{R_3}$	½	5
$\dfrac{1}{R} = \dfrac{1}{20} + \dfrac{1}{30} + \dfrac{1}{60}$		
$\dfrac{1}{R} = \dfrac{3+2+1}{60} = \dfrac{6}{60} = \dfrac{1}{10}$	1	
R= 10 Ω Lowest in parallel		