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

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.

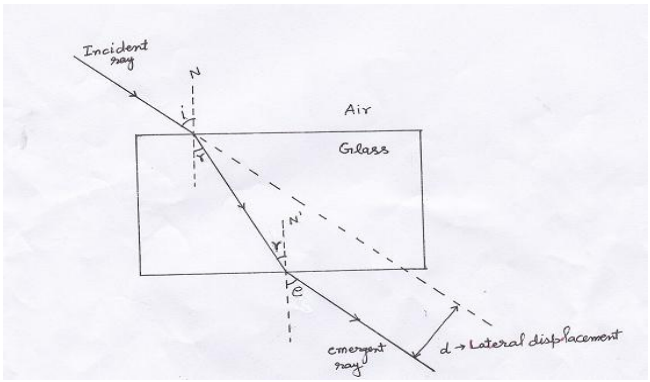
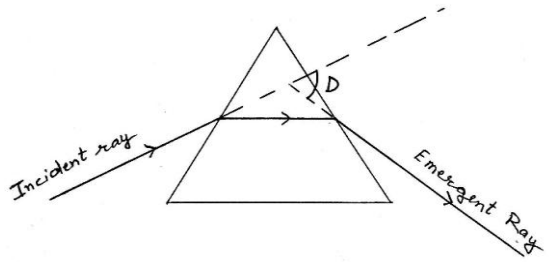
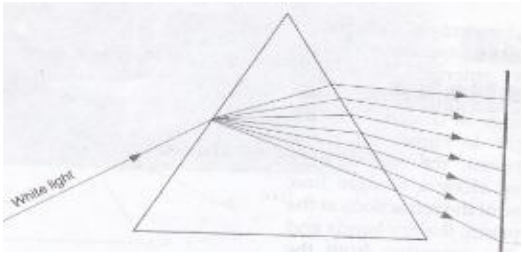
14. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.

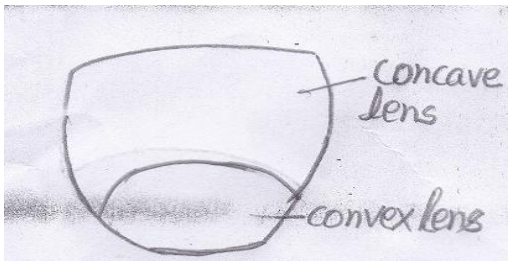
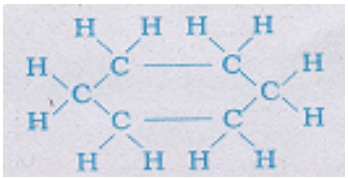
15. Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.

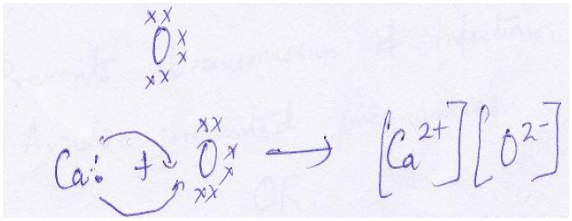
16. The Board permits candidates to obtain photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

MARKING SCHEME –CLASS X SCIENCE (2019-20)			
QUESTION PAPER CODE : SET 31/3/3			
S.NO	**VALUE POINTS/EXPECTED ANSWER**	**MARKS**	**TOTAL MARKS**
	SECTION A		
1.	(a) / Both (A) and (R) are true and (R) is the correct explanation of the assertion.	1	1
2	(c) / A is true but R is false.	1	1
3.	Covalent bonds are formed by sharing of electron pair /pairs between two atoms.	1	1
4.	Tendency of an element to lose electrons. OR Atomic radii increases from Na to Cs due to addition of new shells.	1	1
5.	(c) / 2 A	1	1
6.	(a) / 2 Ω	1	1
7.	(a) / Scattering of light is not enough at such heights	1	1
8.	(d) / Group 16 and Period 3 OR (d) / (A), (B) & (C)	1 1	 1
9.	(c) / A has pH greater than 7 and B has pH less than 7.	1	1
10.	(b) / Formation of crystals by process of crystallisation.	1	1
11.	(c) / Lead storage battery manufacturing factories near A and soaps and detergents factories near B.	1	1
12.	(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
13.	(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
14.	(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
	SECTION B		
15.	(i) Exothermic $CaO + H_2O \rightarrow Ca(OH)_2$ (ii) Double displacement reaction $Na_2SO_4 + BaCl_2 \rightarrow Ba SO_4 + 2NaCl$ (White ppt) (or any other example)	½ 1 ½ 1	 3

16.	(i) Category A / Li, Na, K (ii) Because the physical as well as chemical properties of elements of category A,B and C are different. (iii) No Reason : Because Newlands' law of octaves was applicable only upto calcium.	1 1 ½ ½	3
17.	(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) $HCl_{(aq)} + H_2O_{(l)} \rightarrow H_3O^+_{(aq)} + Cl^-_{(aq)}$ Note : Deduct half marks if equations are not balanced. OR (i) $G = Cl_2$ $C = CaOCl_2$ (ii) $Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$ (iii) Common name – Bleaching Powder Chemical name – Calcium Oxychloride Note : Give full credit for writing common name only	1 1 1 ½ ½ 1 1	3
18.	(a) Population of herbivores will increase as their predator number is less. (b) • Top carnivore/ Tertiary consumer • They are nonbiodegradable , and while passing from one trophic level to another they keep on accumulating at each level / Biomagnification. OR UV radiations split some molecular oxygen (O_2) into free (O) atoms; These atoms then combine with the molecular oxygen to form ozone. (Note : Can be shown as equation form also). • It protects all life forms from the harmful effects of ultra violet radiations. • Because of the release of chemicals like (CFC's) used in refrigerators and fire extinguishers .	1 1 ½ , ½ ½ , ½ 1 1	3
19.	(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
20.	(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	½ ½ 1 ½	

	progeny but reappear in the F_2 progeny are called recessive traits.	½	3
21.	(a) (i) Analogous (ii) Analogous (iii) Homologous (iv) Analogous (b) Homologous organs have similar origin and basic structure but perform different functions whereas Analogous organs have different basic structure but perform similar functions.	 ½ × 4 ½ ½	 3
22.	(a) Snell's Law – The ratio of sine of angle of incidence to the sine of angle of refraction is a constant for the light of a given colour and for the given pair of media. (b)  Ray diagram labelling	1 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. OR (a) (i) Bifocal Lens	1 1 1 1 ½	

	(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	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	(a) **Soaps** / **Detergents** • **Composition** – Sodium or Potassium salts of long chain fatty acids / carboxylic acids. / Ammonium or Sulphonate salts of long chain carboxylic acids. • **Cleansing action in hard water –** Forms scum. / Does not form any scum. (b) • Hydrogen gas is evolved. • Behaves like an acid. (c)  d) Ethanal / Acetaldehyde	1 1 ½ ½ 1 1	5
26.	(a) Sodium (b) Na_2O (c) It catches fire, if kept in open	½ ½ ½	

	(d) NaCl and H_2O (e) (i) $4M + O_2 \rightarrow 2M_2O$ (ii) $2M + 2H_2O \rightarrow 2MOH + H_2 +$ Heat energy. (iii) $M_2O + 2HCl \rightarrow 2MCl + H_2O$ OR (a) Ca (atomic number 20) = 2,8,8,2 Ca : O (atomic number 8) = 2,6 (b)  (c) Calcium ion , Oxide ion (d) • Solid • High melting point and boiling point • Soluble in water • Conducts electricity in molten state	½ 1 1 1 OR ½ ½ 1 ½ , ½ ½ × 4	5
27 .	(a) Oxygenated Blood from Lungs into ⟶ Pulmonary Vein ⟶ Left Atrium (Collects blood on relaxation) (1) (2) (3) Contraction of Left Atrium (4) Left Ventricle (5) Collects blood on expansion (6) Contraction of Left Ventricle (7) Various organs of human body ⟵ Aorta (8) Note : Marks also to be awarded if written in a paragraph form. (b) Leakage results in loss of blood pressure which would reduce the efficiency of the pumping system.	 ½ × 8 1	5

28.

(a) Categories of Contraceptive methods :
(i) Mechanical Barrier – The sperm does not reach the egg.
(ii) Contraceptive Pills - Change the hormonal balance so that the eggs are not released.
(iii) Contraceptive devices – Placed in the uterus to prevent pregnancy.
(iv) Surgical methods- Blocking / cutting of vas deferens/ fallopian tube.

(Any Two) — 1,1

(b) Two bacterial infections :
(i) Gonorrhoea (ii) Syphillis — ½ , ½

Two viral infections :
(i) AIDS (ii) Warts — ½ , ½

(c) (i) Avoids unwanted pregnancies.
(ii) Prevents transmission of infections/ STD's. — ½, ½

OR

(a)

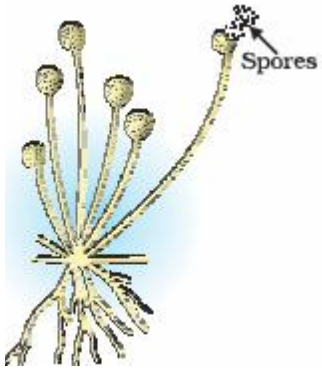


Diagram 1½
Labelling ½

(b)

Budding	Fragmentation
(i) An outgrowth / bud at a specific site develops into a tiny individual and detaches itself from the parent.	(i) Organism simply breaks upon maturation into two or more pieces/ fragments that grow into new individuals.
e.g. Hydra / Yeast	e.g. Spirogyra

1,1

(c) Useful for plants that do not produce seeds/ lost the capacity to produce seeds. — 1 — 5

29.

(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 $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$	½	
	$\frac{1}{v} + \frac{1}{-20} = \frac{1}{2.5}$	1	
	$\frac{1}{v} = \frac{1}{20} + \frac{1}{2.5}$		
	$\frac{1}{v} = \frac{1}{20} + \frac{10}{25}$		
	$\frac{1}{v} = \frac{5+40}{100} = \frac{45}{100}$		
	$v = \frac{100}{45} = \frac{20}{9} = +2.2\text{m}$	½	
	• Nature of image = virtual and erect image	1	
	• Size of image : diminished image	½	
	(b) Concave Mirror	½	
	Reason : to obtain erect and enlarged image of teeth	1	
	OR		
	(i) Convex lens to get a magnified image of the lines on the palm.	1	
	(ii) Between F and 2F of the lens / or at F of the lens	1	
	(iii) focal length f = +10 cm object distance u = -5 cm		
	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	
	• $m = \frac{h_{image}}{h_{object}} = \frac{v}{u}$	½	

	$= \frac{-10}{-5} = 2$ Size of image is 2 times the size of object.	½	5
30.	(a) $P = \frac{V^2}{R}$ $100\ W = \frac{200\ V\ \times\ 200\ V}{R}$ $R = 400\ \Omega$ (b) Energy consumed in 1 day = P × t = 3 × 100 W × 10 h = 3000 Wh = 3 kWh = 3 units Energy consumed in 30 days = 30 × 3 units = 90 units (c) Total Cost = Rs. 6.50 × 90 units = Rs. 585.00 OR (a) If the potential difference across the two ends of a conductor is 1 volt and the current through it is 1 ampere, then the resitance of the conductor is 1 Ω / $1\Omega = \frac{1\ \text{volt}}{1\ \text{ampere}}$ (b) • Electric Power is defined as the rate at which electric energy is consumed /dissipated. • $P = \frac{V^2}{R}$ (c) $R = \frac{V}{I}$ $= \frac{220\ \text{volt}}{5\ \text{ampere}}$ R= 44 Ω Net Resistance $= \frac{132\ \Omega}{n}$, where n is the number of bulbs in parallel. $R = 44 = \frac{132}{n}$ $n = \frac{132}{44} = 3$ resistors	½ 1 ½ ½ 1 ½ 1 1 1 1 1 1	 5