Strictly Confidential: (For Internal and Restricted use only)
Secondary School Examination
March 2019
Marking Scheme – SCIENCE (SUBJECT CODE 086)
(PAPER CODE – 31/1/2)

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 efforts in 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.**
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. 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.
5. If a question does not have any parts, marks must be awarded in the left hand margin and encircled.
6. If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out.
7. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
8. A full scale of marks 1 to 80 has to be used. Please do not hesitate to award full marks if the answer deserves it.
9. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 25 answer books per day.
10. 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 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.

11. While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as (X) and awarded zero (0) Marks.
12. 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.
13. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
14. 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.
15. 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.

SET 31/ 1 / 2

Q. No	Value Point/Expected Answer	Value	Total Marks
	SECTION-A		
1.	• Ampere • Flow of 1 coulomb of charge per second / 1 ampere = $\frac{1coulomb}{1\sec ond}$	½ ½	1
2.	• Methane • 75%	½ ½	1
	SECTION-B		
3.	Name – sodium Symbol – Na Electronic configuration – 2, 8, 1 **OR** (a) Na, Si, Cl – The properties of these three elements are not similar to each other, so no Doberieneir's triads. (b) Be, Mg, Ca – The properties are similar to each other, so it is Dobereiner's triad. / Atomic mass of Mg = $\frac{Atomic\ mass\ of\ \ Be + Atomic\ mass\ of\ \ Ca}{2}$ $= \frac{9+40}{2} + \frac{49}{2} = 24.5$	½ ½ 1 1 1	2
4.	O_2 is carried by haemoglobin of red blood corpuscles / cells. CO_2 is carried by plasma of the blood.	1 1	2
5.	Structure – Fibrous, jelly like structure Role – To change the curvature of eye lens / to change the focal length of eye lens.	1 1	2
	SECTION-C		
6.	• Acid – H_2CO_3 Base - NaOH • $NaOH + H_2CO_3 \rightarrow NaHCO_3 + H_2O$	½ ½ 1	

	• Compound is basic in nature. pH value – ranges between 7 and 10	½ ½	3
7.	i. A_2O – Valency of group one is 1 and of oxygen is 2 ii. AX_3 – Valency of group 13 is 3 and of halogen is 1 iii. AB_2- Valency of element A of group 2 is 2 and of element B of group seventeen is 1.	½+½ ½+½ ½+½	3
8.	• White silver chloride turns grey in sunlight • $2AgCl \xrightarrow{Sunlight} 2Ag + Cl_2$ • Decomposition reaction / Photolytic decomposition OR a) Displacement reaction $Zn + 2\ AgNO_3 \longrightarrow Zn(NO_3)_2 + 2\ Ag$ b) Double displacement reaction $2\ KI + Pb(NO_3)_2 \longrightarrow PbI_2 + 2KNO_3$ (deduct ½ mark for non balanced equation)	1 1 1 ½ 1 ½ 1	3
9.	Transpiration – Loss of water in vapour form through the surface of leaf / stomata of leaf / aerial parts of the plant. Experiment setup : • Take a potted plant and water it. • Cover the plant / branch with a transparent plastic sheet. • Place it in bright sunlight for half an hour. • Moisture in the form of droplets is observed inside the plastic sheet.	1 ½ x 4	3
10.	Feedback mechanism – Mechanism by which the amount of any chemical increases or decreases resulting in secretion of the related hormone. Example – when sugar level rises, insulin secretion increases. when sugar level falls, insulin secretion reduces.	1 1 1	3
11.	Plant hormones – Chemical substances which help the plant to coordinate growth and development i) Auxins/ Gibberellins ii) Cytokinins iii) Abscisic Acid / ABA iv) Auxins/ Gibberellins	1 ½ x4	3

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>12.</td><td>

Pea Plant / Garden pea / Pisum sativum
F_1 – All tall; F_2- Tall and short
Ratio – Tall : Short
3 : 1 / 1:2:1

OR
<table>
<tr><th>Acquired Traits</th><th>Inherited Traits</th></tr>
<tr><td>1. These traits are not transferred from one generation to the next generation</td><td>1. These traits are transferred from one generation to the next</td></tr>
<tr><td>2. They do not bring about change in DNA
Example: Acquiring any skill</td><td>2. They bring about changes in DNA
Example: Eye colour</td></tr>
</table>
(or any other relevant point and example)
</td><td>1
½ + ½
1

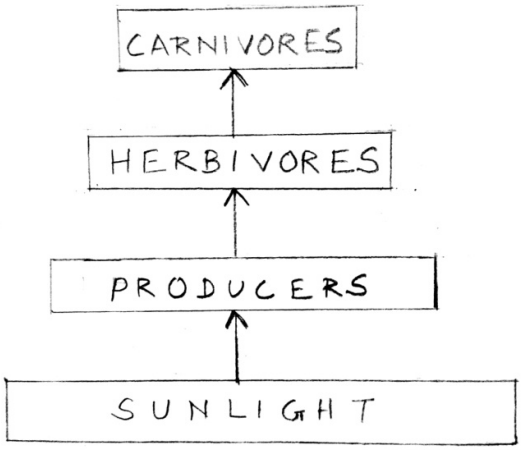
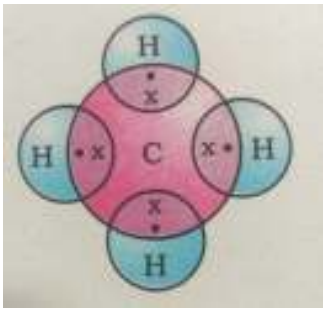
1
1
1</td><td>3</td></tr>
<tr><td>13.</td><td>

Need for equitable distribution of resources :
So that all and not just a handful of rich and powerful people benefit from the development of these resources / all living beings have a birthright to the available resources.
Forces against equitable distribution of resources :
1) Industrialists who work for their own benefit / profit.
2) When environmental laws / rules are not implemented properly.
3) Mismanagement in the distribution of natural resources or any other relevant answer.

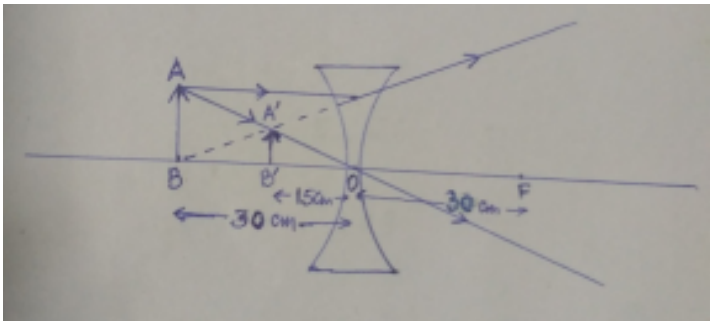
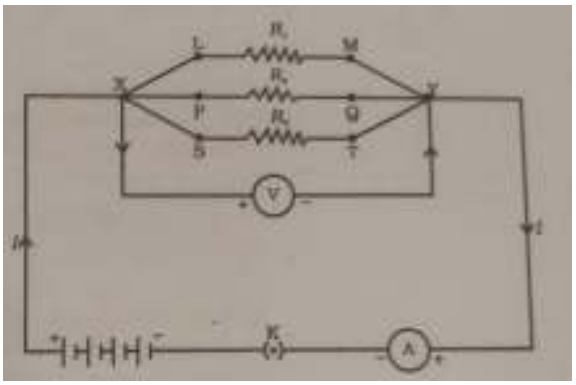
(Or any other relevant point)
(Any two points)
</td><td>1

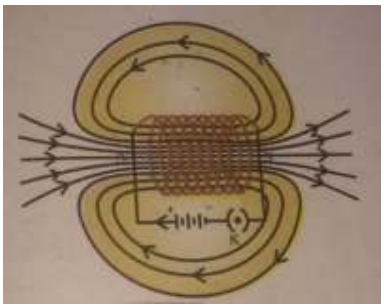
1+1</td><td>3</td></tr>
<tr><td>14.</td><td>
Segregation of waste; Recycling; Composting: Reducing the use of non – biodegradable material: Reuse (Any Three)
OR
The system where all the living organisms in an area together interact with the non – living constituents of the environment.
</td><td>1x3

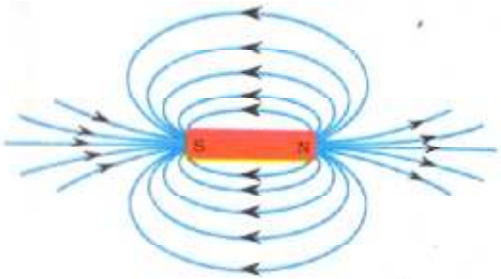
1</td><td></td></tr>
</table>

		2	3
15.	Rainbow – A natural spectrum of sunlight appearing in the sky after a rain shower 	1 2	 3
16.	**SECTION - C** • C_2H_5OH, Ethanol/Ethyl alcohol • Good solvent; used in medicines (Any other) i) $2C_2H_5OH + 2\ Na \rightarrow 2C_2H_5ONa + H_2$ Sodium ethoxide ii) $C_2H_5OH \xrightarrow[443\ K]{\text{Hot Conc. } H_2SO_4} CH_2{=}CH_2 + H_2O$ Ethene OR • CH_4/Simplest hydrocarbon 	½ + ½ ½ + ½ 1 ½ 1 ½ ½ 1	

	• Covalent bonds i) No ions or charged particles are formed ii) Due to weak covalent bonds • Carbon dioxide and water are produced/ $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$	½ 1 1 1	5
17.			
(a)	i) $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$	1	
	ii) $2HgS + 3O_2 \xrightarrow{Heat} 2HgO + 2SO_2$	1	
	iii) $3MnO_2 + 4Al \rightarrow 2Al_2O_3 + 3Mn$	1	
(b)	Alloys are homogeneous mixture of two or more metals or a metal and a non metal Properties : Alloys are stronger / harder / have low melting point / more resistant to corrosion / some are magnetic in nature. (Any two)	1 ½+½	5
18.	u = –30 cm f = –30cm v = ? m = ?		
	$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$	½	
	$\therefore \frac{1}{v} = \frac{1}{f} + \frac{1}{u}$		
	$= \frac{1}{(-30cm)} + \frac{1}{(-30cm)}$		
	$\frac{1}{v} = -\frac{1}{30} - \frac{1}{30}$		
	$= \frac{-2}{30}$		
	$\therefore v = -15cm$	1	
	$m = \frac{v}{u}$		
	$= \frac{(-15cm)}{(-30cm)} = -\frac{1}{2}$	½	
	(ii) Nature – virtual	½	
	Position – 15cm away from the lens, on the same side as the object	½	
	Size – diminished	½	
	Erect / inverted – erect	½	

	(iii)  	1	5
19.	a)  From figure: $I = I_1+I_2+I_3$ $I_1 = \frac{V}{R_1}$, $I_2 = \frac{V}{R_2}$, $I_3 = \frac{V}{R_3}$ $\therefore \frac{V}{R_P} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$ $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ b) $R_1 = R_2 = 12\ \Omega$ V= 6 V $\frac{1}{Rp} = \frac{1}{R1} + \frac{1}{R2} = \frac{1}{12} + \frac{1}{12}$ $\therefore$ $R_p = 6\ \Omega$ $I = \frac{V}{Rp} = \frac{6v}{6v} = 1A$ OR a) $R = R_1 + R_2$ $= 20\ \Omega + 4\ \Omega = 24\ \Omega$	1 1 1 1 ½ ½ 1	

	b) $I = \frac{V}{R}$ $= \frac{6V}{24\,\Omega} = 0.25$ A c) (i) For electric lamp: V = IR $= \frac{6}{24}$ x 20 = 5 V (ii) For Conductor: V = IR $= \frac{6}{24}$ x 4 = 1 V d) P= VI = 5 V x $\frac{6}{24}$A = 1.25 W	1 1 1 1	5
20.	• A coil of many turns of insulated copper wire wrapped closely in the shape of a cylinder • (i)  ii)	1 1 1	



2 | 5

- Distinguishing features –

Solenoid	Bar Magnet
1)Field disappear on stopping the current	1) No effect of current on field.
2) Strength of the field can be changed by changing the current	2) Strength cannot be changed
3) Direction can be reversed by changing the direction of current through it.	3) Direction is fixed and cannot be reversed.

(Any two features)

21.

- Pollination – Transfer of pollen from anther / stamen to stigma of the flower — 1
- Type of Pollination –
  a) Self pollination – Transfer of pollen from anther / stamen to stigma occurs in the same flower — ½ + ½
  b) Cross pollination – Pollen is transferred from anther / stamen of one flower to stigma of another flower — ½ + ½
- Agents of pollination – Wind, Water, Insects and Animals (any 2) — ½ + ½
- A tube grows out of the pollen grain and travels through the style, to reach the female germ cell in the ovary to cause fertilization — 1

OR

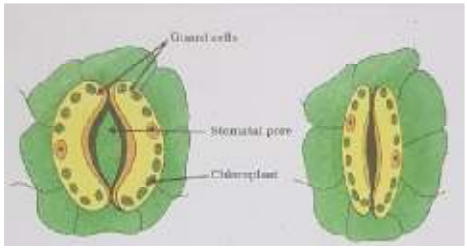
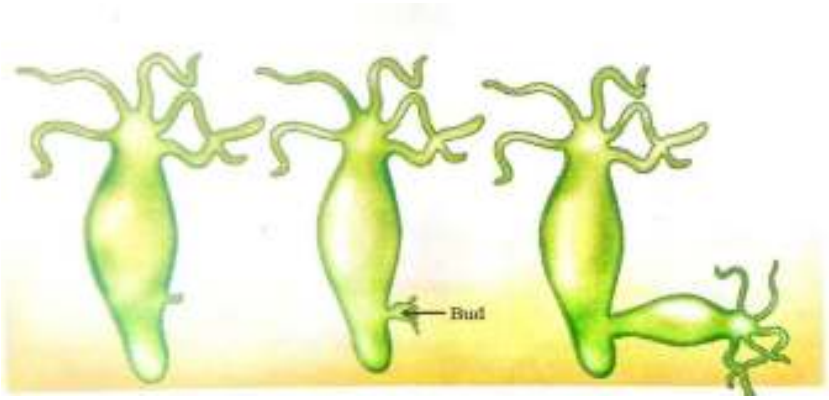
(a)

- Female reproductive system — ½
- Name of parts –
  1: Fallopian tube/Oviduct
  2: Ovary
  3: Uterus
  4: Cervix
  5: Vagina — ½ x 5

(b)

- Method to avoid pregnancy — ½
- Advantages
  - Proper gap between two pregnancies
  - Avoiding unwanted pregnancy
  - Keeping population under control — ½ x 3

5

22.	• Substance taken: KOH • Function: It absorbs CO_2 produced by the germinating seeds Consequence: The water level rises in the test tube dipped in the beaker / partial vacuum is created.	½ ½ 1	 2
23.	 (Any one diagram with any two labellings) **OR** •  Drawing in proper sequence Labelling – Bud	1 ½ x 2 1 1	 2
24.	Precautions: 1) Lens should be held in vertical position with its faces parallel to the screen 2) Clear and sharpest image should be obtained by adjusting the position of lens 3) Three observations should be taken at least. 4) Base of lens, screen and measuring scale should be in straight line (or any other)	 ½ x 4	 2
25.	• Potential difference (V) is directly proportional to current (I) or V∝I • Method: Finding slope of the graph OR • Measure the zero error • Value of zero error should be adjusted to the observed values	1 1 1 1	

			2
26.	• In test tube A • As distilled water contains no salts	1 1	2
27.	• Test Tube A • It changes the colour from blue to red Hydrochloric acid turns blue litmus red. OR • Brisk effervescence is produced • $Na_2CO_3 + 2HCl \longrightarrow 2\ NaCl + H_2O + CO_2$	½ ½ 1 1 1	2