Strictly Confidential- (For Internal and Restricted Use Only) **Secondary School Examination**
COMPARTMENT EXAMINATION
JULY 2018

Marking Scheme – Science 31/3

Series: TYM/C

1. The Marking Scheme provides general guidelines to reduce subjectivity in the marking. It carries only suggested value points for the answer. These are only guidelines and do not constitute the complete answer. Any other individual response with suitable justification should also be accepted even if there is no reference to the text.

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.

3. If a question has parts, please award marks in the right hand side for each part. Marks awarded for different parts of the question should then be totalled up and written in the left hand margin.

4. If a question does not have any parts, marks be awarded in the left hand side margin.

5. If a candidate has attempted an extra question, marks obtained in the question attempted first should be retained and the other answer should be scored out.

6. Wherever only two/three of a 'given' number of examples/factors/points are expected only the first two/three or expected number should be read. The rest are irrelevant and should not be examined.

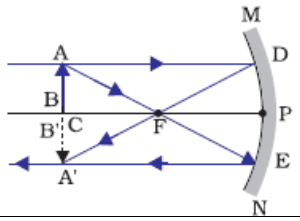
7. There should be no effort at 'moderation' of the marks by the evaluating teachers. The actual total marks obtained by the candidate may be of no concern of the evaluators.

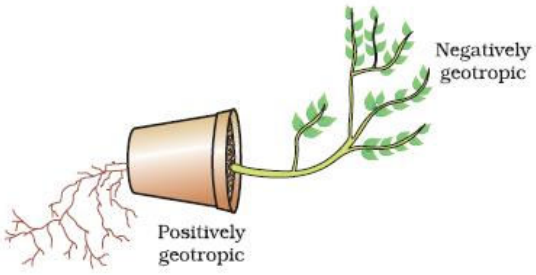
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.

9. ½ mark may be deducted if a candidate either does not write units or writes wrong units in the final answer of a numerical problem.

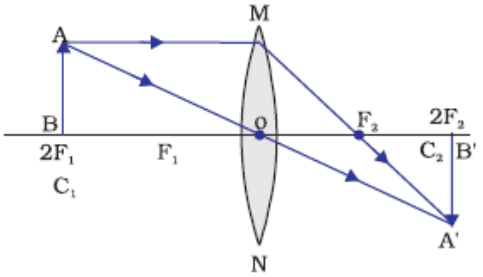
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

11. As per orders of the Hon'ble Supreme Court the candidates would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points given in the marking scheme.

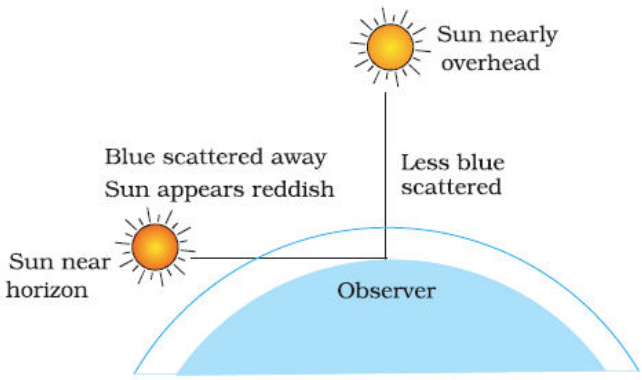
	Expected Answer/ Value Point	Marks	Total
	SECTION – A		
Q 1.	All pea plants were tall in F1 generation	1	1
Q2.	Methane/ CH_4, Hydrogen/ H_2, Hydrogen Sulphide/ H_2S, Carbon dioxide/ CO_2, (Any two)	½, ½	1
Q3.	a) Forebrain b) Medulla/ Hind Brain c) Cerebellum/ Hind Brain d) Cerebellum/ Hind Brain	½ x 4	2
Q4.	• Covalent • Because carbon atom has 4 valence electrons, hence it is not able to gain four electrons/ form C^{4-} ion or lose four electrons/ form C^{4+} ion to attain noble gas configuration. So, it shares electrons to form covalent bonds/ compounds. • CH_4 (or any other)	½ 1 ½	2
Q5.	$u = -40$ cm $f = -20$ cm		
	Position of image: 40 cm in front of the concave mirror	½	
	Nature : Real/ inverted	½	
	Ray diagram:  	1	2
Q6.	The upward growth of shoots and downward growth of roots in response to the pull of earth's gravity is called geotropism	1	

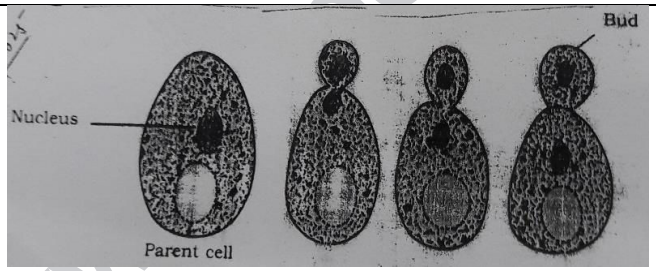
	 Diagram Two Labels	1 ½ , ½	3
Q7.	• Managing resources to meet current basic human needs, while preserving the resources for the needs of future generations and maintaining the quality of the environment.	1	
	• Importance To maintain the quality of the environment/ To ensure the continuity of the resources	1	
	• Reuse Because process of recycling uses some energy.	½ ½	3
Q8.	• Characters that a person acquires during one's life time are known as acquired characters / traits. • Such changes do not occur in the reproductive tissues. • Changes in the non-reproductive tissues are not passed on to the DNA of the germ cells and therefore not inherited by the next generation.	1 1 1	3
Q9	$R = R_1 + R_2 + R_3$		
	$R = 5\ \Omega + 8\ \Omega + 12\ \Omega = 25\ \Omega$	1	
	$V = 6V$		
	$V = IR$		
	$\therefore I = \frac{V}{R} = \frac{6V}{25\Omega} = 0.24\ A$	1	
	Hence, Current through 12 Ω resistance is $\frac{6}{25} A = 0.24\ A$		
	$V = IR = \frac{6A \times 12\ \Omega}{25} = 2.88\ V$	1	3
	OR		
	Electrical resistivity of the material of a conductor is the resistance offered by the conductor of length 1 m and area of cross-section 1 m^2	1	
	$\rho = \frac{\mathcal{R}A}{l}$		
	unit of $\rho = \frac{\text{ohm metre}^2}{\text{metre}} = \text{ohm metre}$	1	
	Resistance of wire is doubled if its length is doubled.		
	Hence current is reduced to half.		
	$\therefore A\text{mmeter reading} = \frac{100mA}{2} = 50\ mA$	1	

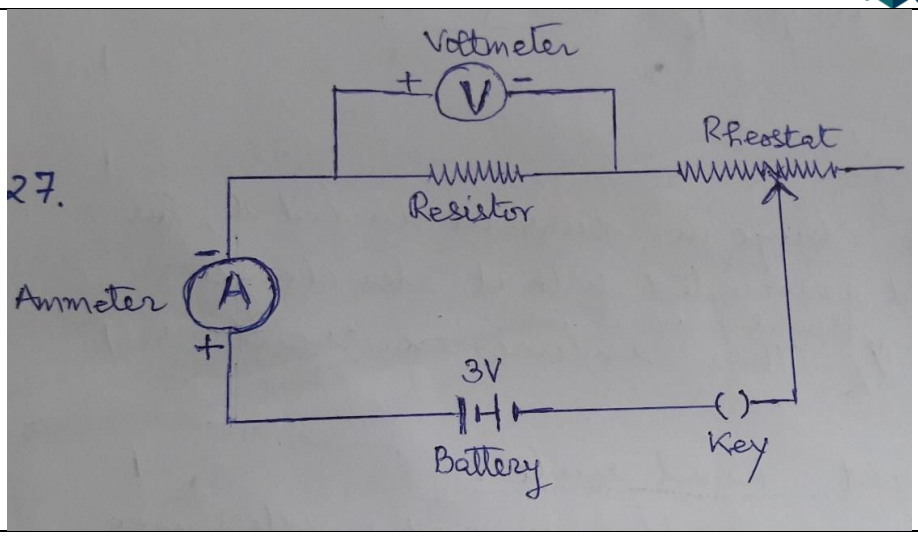
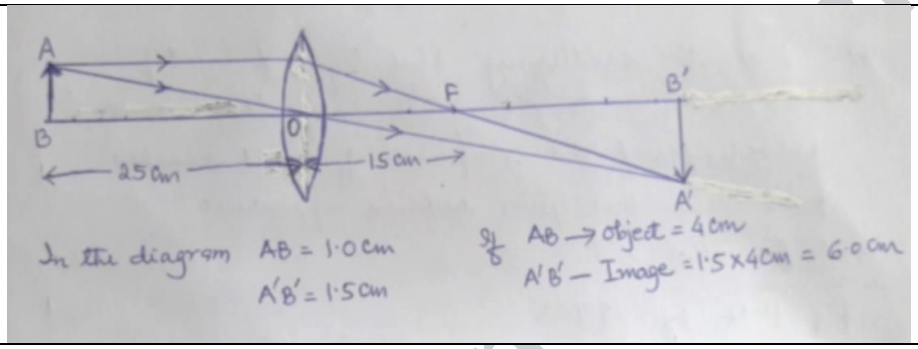
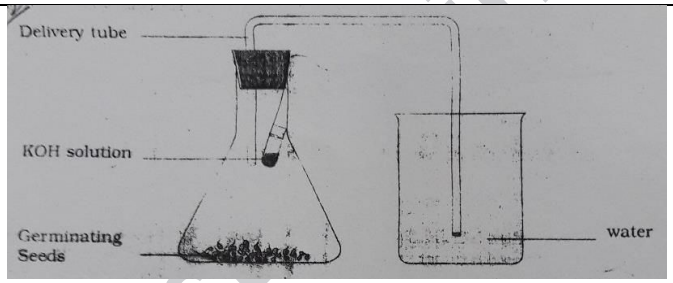
Q10.	• Wet blue litmus paper • Reason: Hydrogen ions are produced by HCl in the presence of water. • It has acidic nature • $HCl + H_2O \rightarrow H_3O^+ + Cl^-$	½ 1 ½ 1	3
	OR		
	a) The cake will have a bitter taste because of the formation of Na_2CO_3/ sodium carbonate while baking/ heating b) By adding tartaric acid c) The liberated CO_2 gas	½, ½ 1 1	
Q11.	$P_1 = 1000\ W = \frac{1000}{1000}\ kW$ $\quad t_1 = 5\ h$		
	$P_2 = 400\ W = \frac{400}{1000}\ kW$ $\quad t_2 = 10\ h$		
	No. of days, n = 30		
	$E_1 = P_1 \times t_1 \times n$	½	
	$= 1\ kW \times 5\ h \times 30 = 150\ kWh$	½	
	$E_2 = P_2 \times t_2 \times n$		
	$= \frac{400}{1000}\ kW \times 10\ h \times 30 \quad = 120\ kWh$	½	
	∴ Total energy = (150 + 120) kWh = 270 kWh	½	
	∴ Total cost = 270 x 6 = Rs. 1620	1	3
Q12.	a) Because they are non-biodegradable	1	
	b) • Carrying tiffin and water in steel containers • Encourage the use of ink pens (ball pens are made up of plastic)/or any other. (any two)	½ + ½	
	c) By spreading awareness in the form of Nukkad Natak, Speeches in Morning Assembly, Class Discussions, Display Boards etc. (any two ways)	½ + ½	3
Q13.	(a) (i) HCl is oxidized	½	
	(ii) MnO_2 is reduced	½	
	(b) • Oxidation: Gain of Oxygen or loss of Hydrogen	1	
	• Reduction: Gain of Hydrogen or loss of Oxygen	1	3
Q14.	• Vegetable oil is converted into saturated fat	½	
	• Hydrogenation	1	
	• Vegetable oil is liquid and saturated fat is solid at room temperature	1	
	• Nickel acts as a catalyst.	½	3
Q15.	a) Convex lens	1	
	b) Focal length of the lens is 2 m. Distance of candle flame from the lens is 4 m	½ ½	

	c) Ray Diagram 	1	3
	OR		
	$h_1 = +5$ cm ; $u = -30$ cm ; $f = +15$ cm; v =?		
	$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$	½	
	$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{(+15)} - \frac{1}{(-30)}$	½	
	$= \frac{1}{15} + \frac{1}{30} = \frac{2+1}{30} = \frac{3}{30} = \frac{1}{10}$		
	$\therefore v = +10$ cm	½	
	$\frac{h_2}{h_1} = -\frac{v}{u} \Rightarrow h_2 = -\frac{(+10)}{(-30)} \times (+5) = +\frac{5}{3} = +1.66$ cm	1	
	Nature – virtual, erect	½	
Q16.	a) Magnetic field line: • Path along which a hypothetical free north pole would tend to move • By drawing a tangent on the magnetic field line at that point	1 1	
	b) Yes. With change in current in the coil X, the magnetic field associated with it also changes around the coil Y placed near it. This change in magnetic field induces a current in the coil Y.	1 1	
	c) Fleming's right hand rule Stretch the thumb, forefinger and middle finger of right hand so that they are perpendicular to each other. If the forefinger indicates the direction of the magnetic field and the thumb shows the direction of motion of the conductor, then the middle finger will show the direction of induced current in the conductor.	1	5
Q17.	a) Glucose $\xrightarrow{\text{In Cytoplasm}}$ Pyruvate, $\xrightarrow{\text{In absence of oxygen}}$ Ethanol + CO_2 + Energy	½, 1	
	b) Fishes take in water through the mouth and force it past the gills where the dissolved oxygen is taken up by the blood.	1	
	c) Alveoli Functions – They contain an extensive network of blood vessels which exchange gases. They increase surface area of absorption of gases.	½ ½ ½	
	d) Haemoglobin Role – Due to high affinity for O_2, it helps in its transport from alveoli to the tissue	½ ½	5

	OR		
	a) • Process – Photosynthesis • Type of Nutrition – Autotrophic Nutrition Explanation – Autotrophic nutrition is the process where plants prepare their own food, using inorganic material such as CO_2 and H_2O in presence of Sunlight and Chlorophyll. • $6CO_2+12H_2O \xrightarrow{\text{Chlorophyll, Sunlight}} C_6H_{12}O_6+6O_2+6H_2O$ (Glucose) • Raw material — CO_2, H_2O	½ ½, ½ 1 ½, ½	
	b) i) Absorption of light energy by chlorophyll ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen iii) Reduction of Carbon dioxide to Carbohydrates	1 ½	

Q18.	a)	METALS	NON-METALS		
		1 Lose electrons to form positive ions/ are electropositive in nature	Gain electrons to form negative ions/ are electronegative in nature		
		2 React with dilute acids to liberate hydrogen gas	Do not react with dilute acids		
		3 Generally metal oxides are basic in nature	Generally non-metal oxides are acidic in nature	1 x 3	
	b)	i) Painting, ii) Oiling, iii) Galvanization, iv) Alloying (or any other) (any two)		1 x 2	5
Q19.	a)	Presbyopia: Defect of vision when a person is unable to see nearby as well as far off objects clearly. Causes: Gradual weakening of the ciliary muscles/ diminishing flexibility of the eye lens. Correction: By the use of bi-focal lenses.		1 x 3	
	b)	Due to scattering of blue light/ light of shorter wavelengths, light of longer wavelengths/ red component of light reaches our eyes. This gives reddish appearance of the sun.		1	
				1	5

Q20.	a) • Occurrence of differences between organisms is called Variation. • New variation may arise during the process of DNA copying that already has variations accumulated from previous generations. Combining variations from two or more individuals would thus create new combinations of variations. • Species having suitable variations have more chances of survival in case of change in environmental conditions.	½ 1 ½ 1	
	b) In sexually reproducing organisms male and female gametes/ reproductive cells with only half the number of chromosomes (as in the parent cell) are produced. During fertilization, when male and female gametes fuse to give rise to a zygote, original number of chromosomes are restored.	2	5
Q21.	a) Valency first increases, then decreases b) Decreases c) Increases d) Increases e) Changes from basic to acidic	1 x 5	5
	OR		
	a) Atomic mass b) (i) He could classify all the 63 elements known at that time (ii) He left gaps for the yet to be discovered elements. (iii) He predicted the properties of such elements. (any two) c) (i) Position of isotopes (ii) Irregular increase in atomic masses in going from one element to the next, making the prediction of undiscovered elements difficult. (iii) Position of Hydrogen. (any two)	1 1 x 2 1 x 2	
	SECTION - B		
Q22.	i) Blue litmus turns red. ii) On adding solid sodium carbonate or sodium hydrogen carbonate, brisk effervescence is observed.	1 x 2	2
Q23.	 Diagram Elongation and division of Nucleus Budding of Parent Cell	1 ½ ½	2

Q24.		2	2
Q25.	If $\angle i = 40^0$ then $\angle e = 40^0$ $\angle r = 23^0$ If $\angle i = 50^0$ then $\angle e = 50^0$ $\angle r = 30^0$	½ x 4	2
	OR		
		1 1	
Q26.	 Diagram Labelling KOH Level of water	1 ½ ½	2
Q27.	• Sulphate, Chloride or hydrogen Carbonate of Calcium or Magnesium (or their formula) (any one) • By adding equal amount of soap to water taken in two test tubes, shaking vigorously and comparing the length of lather/foam formed in each test tube.	1 1	2