

**Strictly Confidential- (For Internal and Restricted Use Only) Secondary School Examination**  
**SUMMATIVE ASSESSMENT - II**  
**March 2015**

**Marking Scheme – Science (Outside Delhi) 31/2**

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.  $\frac{1}{2}$  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.

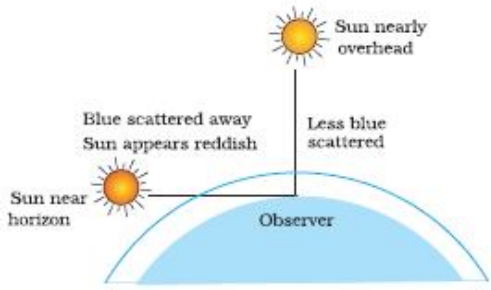
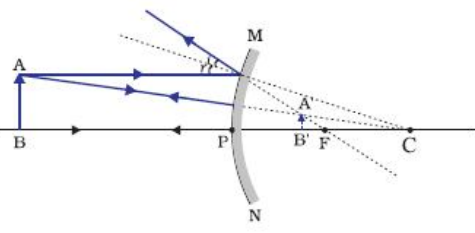
**MARKING SCHEME**  
**CLASS X – OUTSIDE DELHI**

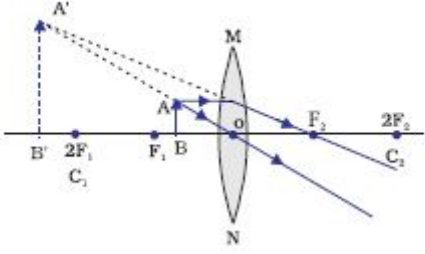
Code No. 31/2

	Expected Answer/ Value point <b>SECTION – A</b>	Marks	Total
Q1.	Ten.	1	1
Q2.	Genes / Chromosomes	1	1
Q3.	Because only plants can utilize the radiant energy of the sun and transform it to chemical form during photosynthesis.	1	1
Q4.	<p>i) <math>n_g = \frac{4}{3}</math>; <math>n_w = \frac{3}{2}</math>; <math>v_g = 2 \times 10^8 \text{ m/s}</math></p> <p><math>n_g = \frac{c}{v_g}</math></p> <p><math>\therefore c = n_g v_g = \frac{4}{3} \times 2 \times 10^8 \text{ m/s} = 2.67 \times 10^8 \text{ m/s}</math></p> <p>ii) <math>n_w = \frac{c}{v_w}</math></p> <p><math>\therefore v_w = \frac{c}{n_w} = \frac{2.67 \times 2 \times 10^8}{3} = 1.78 \times 10^8 \text{ m/s}</math></p> <p><b>Note:</b> Full marks to be awarded for those who attempt with the correct values of refractive indices.</p>	<p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p>1</p>	2
Q5.	<p>Spreading awareness / different ways to make people realize: -</p> <p>a) Organizing street plays, b) Distributing pamphlets to the residents, c) Reuse / recycle of the waste products, d) Calling meeting of residents, welfare society / association of the locality, e) Advertisements through TV / radio, f) Putting posters / hoardings, g) Segregation of the wastes as per the nature of the waste. Or any other (any two)</p>	$\frac{1}{2} \times 4$	2
Q6.	<p>Advantages (any two) :-</p> <p>a) Recharges the ground water, b) Prevents evaporation of water, c) Prevents breeding of mosquitoes d) Prevents contamination e) Mitigates flood and drought (or any other relevant point)</p>	1 + 1	2
Q7.	A group of organic compounds having the same functional group and similar structures in which the successive members differ by $\text{CH}_2$ group.	1	

	$C_3H_4, C_4H_6, C_5H_8$ : Alkynes $C_3H_6, C_4H_8, C_5H_{10}$ : Alkenes	$\frac{1}{2} + \frac{1}{2}$ $\frac{1}{2} + \frac{1}{2}$	3
Q8.	<ul style="list-style-type: none"> <li>Test 1 (Litmus Test)</li> </ul> <p>Take two strips of blue litmus paper. Place a drop each of the alcohol and carboxylic acid on these strips separately. The blue litmus paper turns red in the case of carboxylic acid and remains unaffected in the case of alcohol.</p> <ul style="list-style-type: none"> <li>Test 2 (Sodium hydrogen carbonate test / sodium carbonate test)</li> </ul> <p>A pinch of sodium hydrogen carbonate or sodium carbonate is added, to both separately. If brisk effervescence with the evolution of a colorless gas is observed, it indicates the presence of carboxylic acid.</p> <p>If no change is observed then it confirms the presence of the alcohol.</p> <ul style="list-style-type: none"> <li>Test 3 – Ester test or any other suitable test <b>(any two)</b></li> </ul>	$\frac{1}{2}$  1  $\frac{1}{2}$  1	3
Q9.	(a) Group 2, as each element has two valence electrons / two electrons in the outermost shell of the atom. (b) Be, because Be has the least tendency to lose electrons. (c) Ca, as Ca has the maximum no. of shells and atomic size increases down the group.	$\frac{1}{2}, \frac{1}{2}$ $\frac{1}{2}, \frac{1}{2}$ $\frac{1}{2}, \frac{1}{2}$	3
Q10.	Electronic configuration of element with atomic no. 16 is 2,8,6. Since it has 3 shells, the period no. will be 3. Since the no. of valence electrons is 6, the group no. will be $10 + 6 = 16$ . Valency of the element will be 8- valence electrons ie $8 - 6 = 2$ .	1 $\frac{1}{2}$ $\frac{1}{2}$ 1	3
Q11.	<div style="display: flex; justify-content: space-between;"> <div> <p><b><u>Sexual reproduction</u></b></p> <p>i) Involves two parents – male and female.</p> <p>ii) Involves two parents – male and female.</p> <p>iii) Fertilization / zygote formation is observed.</p> <p>iv) Meiosis occurs during gamete formation.</p> <p>v) Genetic variation occurs.</p> </div> <div> <p><b><u>Asexual reproduction</u></b></p> <p>i) Involves only one parent.</p> <p>ii) No gametes are produced</p> <p>iii) No fertilization / zygote formation is observed</p> <p>iv) Meiosis does not occur at any stage of reproduction.</p> <p>v) Genetic variation does not occur.</p> <p style="text-align: right;">(any three)</p> </div> </div>	1+1+1	3
Q12.	Significance – prevent STDs, Advantage of small family, Less mortality among new borns, Reduces the cases of maternal mortality.	$\frac{1}{2} \times 4$	

	Areas which have improved – Family Planning, - Decrease in STD cases (any other)	$\frac{1}{2} \times 2$	3
Q13.	Chromosomes – thread like structures made up of DNA found in the nucleus. The original number of chromosomes becomes half during gamete formation. Hence, when the gametes combine, the original number of chromosomes gets restored in the progeny. (or same thing explained in the form of a flow chart).	1  1,1	  3
Q14.	a) F1 generation - blue b) 25% c) BB : Bw = 1:2	1 1 1	  3
Q15.	<ul style="list-style-type: none"> <li>Speciation – evolution of a new species from pre-existing species</li> <li>Occurring due to accumulation of variations</li> <li>By processes like genetic drift / geographical barriers like mountains, rivers etc., leading to incapability to reproduce amongst themselves in the population.</li> </ul> <p>Natural selection –</p> <ul style="list-style-type: none"> <li>Change in frequency of some genes in a population</li> <li>Which give survival advantage to a species from elimination.</li> <li>Ex. – in a population of beetles, a new variation (green colour) get survival benefit / advantage to green beetles whereas other (red) perishes.</li> </ul>	$\frac{1}{2} \times 3$     $\frac{1}{2} \times 3$	     3
Q16.	<p>(i) Scattering – Phenomenon of spreading of light (diffused reflected light) caused by minute particles (dust, smoke etc.) in the atmosphere.</p> <p>(ii) Sky appears blue because blue color of sunlight scatters more strongly (due to shorter wavelength) than the red color by the fine particles in the air.</p> <p style="text-align: center;">OR</p> <p>At sunrise the blue color of sunlight get scattered due to smaller wavelength while passing through the thicker layers of the atmosphere. The red component (due to longer wavelength) reaches us, giving red appearance, of the Sun.</p> <p><b>Note:</b> If explained by following diagram (fully labeled) give full credit.</p>	1       2	       3

			
Q17.	<p>Convex mirror</p>  <p>Use: As rear view mirror in vehicles/ Also in Malls, Hotels, Airports for security reasons.</p> <p>Why:</p> <ul style="list-style-type: none"> <li>• Forms erect image,</li> <li>• Wider field of view.</li> </ul>	<p><math>\frac{1}{2}</math></p> <p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	3
Q18.	<p>Ecosystem – An ecosystem is defined as a dynamic system of biotic and abiotic components and there is a continuous flow of energy between the different components.</p> <p>a) Biotic component / living organisms</p> <p>b) Abiotic component / physical factors</p> <p>Cleaning of aquarium – because of the,</p> <p>a) absence of natural decomposers</p> <p>b) stagnancy of water.</p>	<p>1</p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p> <p><math>\frac{1}{2}</math></p>	3
Q19.	<p>Fossils are preserved remains or impressions of pre-historic organism in the different strata of the earth's crust.</p> <p>Or</p> <p>Fossils are dead remains of animals and plants from remote past.</p> <p>Fossils are formed when dead organism are not completely decomposed. The organism may get trapped in resins of tree, lava of volcanoes or hot mud, which when hardens retains the animal's parts thus forming fossils.</p> <p>Two methods of determining the age of fossils –</p> <p>a) Relative method – by estimating the age of the layer of earth's crust where the fossil is found. Fossils near the surface are recent and those in the deeper layers are more ancient.</p> <p>b) Radio-carbon dating method – by detecting the ratios of different isotopes of carbon in the fossils.</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	

	Role of fossils – By determining the age of fossils we come to know the type of earth strata present at that time/ We can also know the type of animals and plants present on the earth at that time/ and also helps in establishing evolutionary relationships by providing connecting links.		5
	(any one)	1	
Q20.	a) Testis – secrete male hormone – testosterone	1	
	Functions – i) formation of sperms, ii) development of secondary sexual characters.	$\frac{1}{2} \times 2$	
	b) i) fallopian tube / oviduct. ii) uterus.	$\frac{1}{2} \times 2$	
	• Placenta is a special disc like tissue embedded in the mother's uterine wall and connected to the foetus / embryo.	1	
	• Placenta provides a large surface area for glucose and oxygen/ nutrients to pass from the mother's blood to the embryo/ foetus.	1	5
Q21.	• Power of lens:- Ability of a lens to converge or diverge the light rays falling on it/ The degree of convergence or divergence of light rays achieved by a lens/ Reciprocal of focal length of the lens.	1	
	• 1 dioptre – It is the power of a lens whose focal length is 1 metre.	$\frac{1}{2}$	
	• $f_A = +10\text{cm} = 0.1\text{m}$ Converging/ Convex lens	$\frac{1}{2}$	
	$P_A = \frac{1}{f_A} = \frac{1}{+0.1\text{m}} = +10\text{D}$	$\frac{1}{2}$	
	$f_B = -10\text{cm} = -0.1\text{m}$ Diverging/ Concave lens	$\frac{1}{2}$	
	$P_B = \frac{1}{f_B} = \frac{1}{-0.1\text{m}} = -10\text{D}$	$\frac{1}{2}$	
	• In this case the object will be between the optical centre and principal focus of the lens. Hence the convex lens, i.e., lens A will form virtual and magnified image of the object.	$\frac{1}{2}$	
	• 	1	5
Q22.	• Ciliary muscles modify the curvature of the eye lens to enable the eye to focus objects at varying distances/ help in adjusting the focal length of the eye lens	1	
	• Presbyopia	$\frac{1}{2}$	
	• Bifocal lens	$\frac{1}{2}$	
	(a) Defect – Myopia/ Nearsightedness	$\frac{1}{2}$	
	Corrective lens – Concave/ Diverging lens	$\frac{1}{2}$	

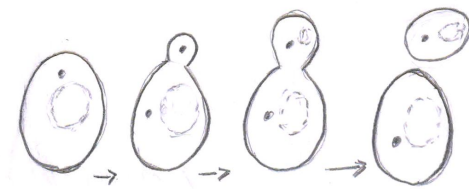


- Q35.
- Carbon dioxide /  $\text{CO}_2$ .
  - Lime Water turns milky when  $\text{CO}_2$  is passed through it. /  $\text{CO}_2$  extinguishes a burning splinter.

1  
1 2

Q36. Fine

1



1 2