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

Marking Scheme – Science (Foreign) 31/2/1

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.

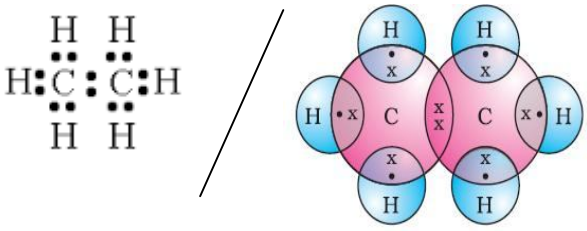
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.

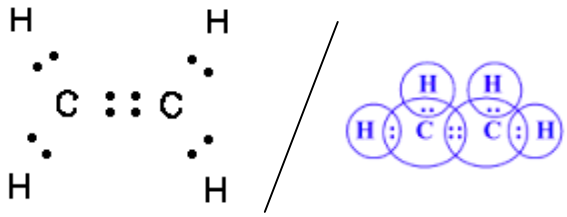
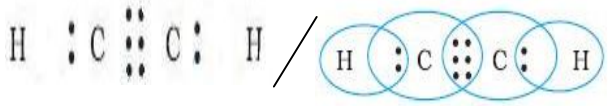
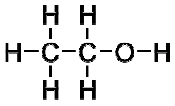
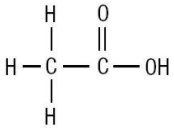
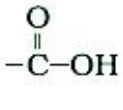
9. ½ mark may be deducted if a candidate either does not write units or writes wrong units in the final answer of a numerical problem.

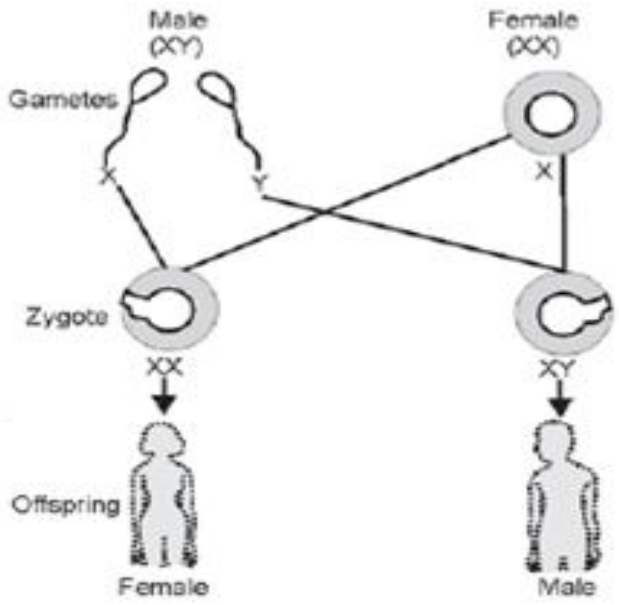
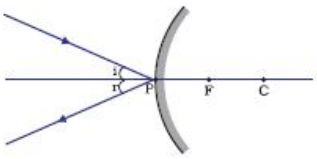
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

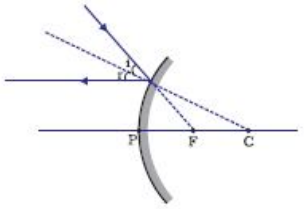
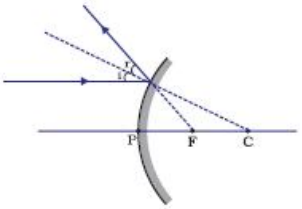
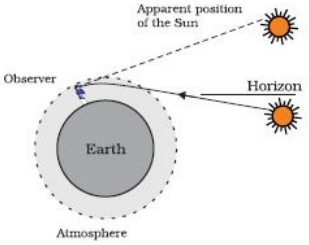
11. As per orders of the Hon'ble Supreme Court the candidates would now be permitted to obtain photocopy of the Answer Book on request on payment of the prescribed fee. All Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points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

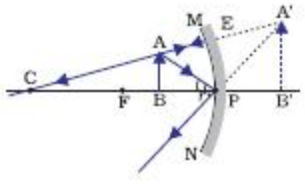
MARKING SCHEME **Code No. 31/2/1**
CLASS X – FOREIGN

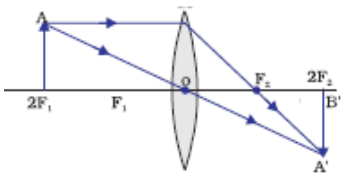
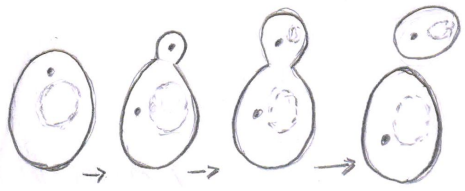
	Expected Answer/ Value point **SECTION – A**	Marks	Total
Q1.	Hydrogenation	1	1
Q2.	Leishmania, Binary fission	½, ½	1
Q3.	• Hawk • Biomagnification	½ ½	1
Q4.	Stars are very distant and approximate point-sized sources. Path of starlight changes continuously due to gradual changing of refractive index of the layers of air. Thus, the apparent position of the star fluctuates and the amount of starlight entering the eye flickers giving the twinkling effect.	½ 1 ½	2
Q5.	Reduce, Reuse, Recycle (for all the three) (only ½ mark if two are mentioned) Examples - Switch off the fans and bulbs when not in use, - Reuse of paper, polythene bags, etc., - Reduce the wastage of water / paper or any other item (or any other relevant example) (any two)	1 ½ x 2	2
Q6.	Advantages of ground water – I. It does not evaporate. II. Spreads out to recharge wells. III. Provides moisture for vegetation over a large area. IV. Does not provide breeding ground for mosquitoes. V. Remain protected from contamination from human excreta, etc.. (any four)	½ × 4	2
Q7.	i) Ethane: C_2H_6 	½ , ½	

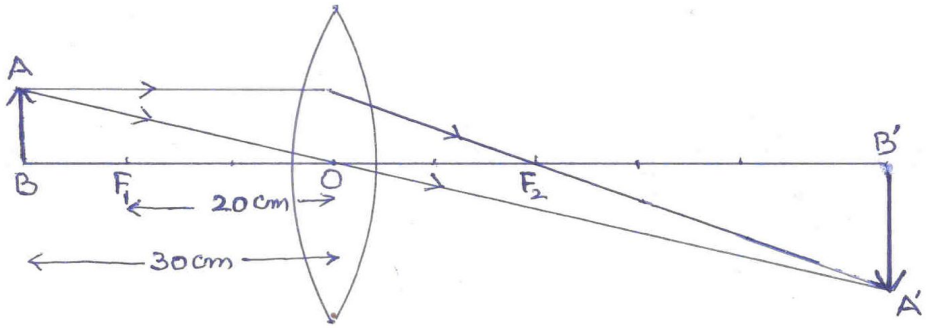
	ii) Ethene: C_2H_4 	½ , ½	
	iii) Ethyne: C_2H_2 	½ , ½	3
Q8.	An atom or a group of atoms / heteroatoms which determine the chemical properties of an organic compound.	1	
	Name — **Structural Formula** — **Functional Group** Ethanol  -OH	½ , ½	
	Ethanoic acid  -COOH 	½ , ½	3
Q9.	• For systematic and simplified study of elements and their compounds.	½	
	• Basic property: Atomic Number.	½	
	• Modern periodic Law: The properties of elements are a periodic function of their atomic number.	½	
	• Metals are found on the left side and centre of the Modern Periodic Table.	½	
	• Metalloids are found in a zig-zag manner between the metals and the non-metals.	½	
	• Non-metals are found on the right side of the Modern Periodic Table.	½	3
Q10.	Electronic configuration : 2 ,8 . 8 , 2	½	
	i) 'X' is present in the 2nd group and 4th period of the periodic table.	½ , ½	
	ii) XY	½	
	iii) Basic because X is a metal and the oxides of metals are basic in nature. (Y , Atomic number= 8 , oxygen)	½ , ½	3
Q11.	• Asexual reproduction does not involve genetic fusion while sexual reproduction involves fusion of male and female gametes to form a zygote.	1	
	• Species reproducing sexually have better chances of survival.	1	
	Reason – Sexual reproduction gives rise to more variations which are essential for evolution as well as survival of species under unfavorable conditions.	1	3
Q12.	When Planaria is cut into many pieces, each piece grows into a complete organism; this regeneration process is carried out by specialized cell; which proliferate; develop and differentiate into various cell types and tissues.	½ x 4	
	Regeneration is not same as reproduction as most of the organisms would not normally depend on being cut up to be able to reproduce.	1	3

	Note: If a candidate draws only the diagram showing the process then award 1 mark only, otherwise diagram is not required.		
Q13.	• Placenta is a specialized tissue embedded in the uterine wall. It contains villi on the embryo's side and blood spaces on the mother's side.	1×2	
	Function- helps in exchange of nutrients, gases and waste materials between the mother and embryo / foetus.	1	3
Q14.	• Flow chart		
	Parents 	½ ½ ½ ½	
	• Justification: Women produce only one type of ovum / (carrying X chromosome) and males produce two types of sperms (carrying either X or Y chromosome) in equal proportions. So the sex of a child is a matter of chance depending upon the type of sperm fertilizing the ovum.	1	3
Q15.	• Yes, it is possible.	1	
	Example – When pure tall pea plants are crossed with pure dwarf pea plants, only tall pea plants are obtained in F1 generation.	½	
	On selfing tall plants of F1, both tall and dwarf plants are obtained in F2 generation in the ratio 3:1.	½	
	Reappearance of the dwarf character, a recessive trait in F2 generation shows that the dwarf trait/ character was present in individuals of F1 but it did not express (due to the present of tallness, a dominant trait / character)	1	3
Q16.	a) 	1	

	b) 	1	
	c) 	1	3
Q17.	• Due to atmospheric refraction, the sun is visible to us about two minutes before the actual sun-rise and about two minutes after the actual sun-set	1	
	• 	2	3
Q18.	Ozone is a molecule containing three atoms of oxygen (O_3) / a highly poisonous gas present in the upper layers of the atmosphere. Formation of ozone – the UV radiations split some molecular oxygen (O_2) apart into free oxygen atoms (O + O). These atoms then combine with molecular oxygen to form ozone. Or $O_2 \xrightarrow{UV} O + O$ $O + O_2 \rightarrow O_3$ (Ozone)	1 ½ , ½	
	Effect – ozone layer shields the surface of the earth from the damaging UV radiations of the sun.	1	3
Q19.	Carbon has 4 electrons in its outermost shell .It cannot lose 4 electrons to form C^{4+} because very high energy is required to remove 4 electrons.	1 ½	
	It cannot gain 4 electrons to form C^{4-} ions because it is difficult for 6 protons to hold on to 10 electrons.	1 ½	
	• Ionic / Electrovalent Bonds ,	½	
	• Covalent bonds.	½	
	• There are no charged particles in carbon compounds and hence poor conductors of electricity.	1	5

Q20.	a) A – Stigma B –Pollen tube C – Ovary D – Female germ cell / Egg cell	½ x 4	
	b) Pollination – Transfer of pollen grains from anther to the stigma of a flower.	½	
	Significance of pollination – Process of pollination leads to fertilization as it brings the male and female gametes together for fusion.	½	
	c) After a pollen falls on a suitable stigma, the pollen tube grows out of the pollen grain and travels through the style to reach the ovule in the ovary. Here the male germ cell (carried by the pollen tube) fuses with the female germ cell to form a zygote.	1	
	i) Ovule ii) Ovary	½ ½	5
Q21.	Speciation - formation of new species from pre-existing ones.	1	
	Factors – 1) Mutations 2) Natural selection 3) Genetic drift 4) Geographical Isolation	½ x 4	
	Geographical isolation cannot be a major factor in the speciation of a self pollinating plant species.	1	
	Reason – physical barrier cannot be created in self pollinating plants.	1	5
Q22.	• h = +1.5 cm; f = –12 cm; u = –18 cm v = ? h' = ?		
	a) $\frac{1}{f}=\frac{1}{v}+\frac{1}{u}$	½	
	$\therefore \frac{1}{v}=\frac{1}{f}-\frac{1}{u}=\frac{1}{(-12)}-\frac{1}{(-18)}$	½	
	$=\frac{-1}{12}+\frac{1}{18}=\frac{-3+2}{36}=\frac{-1}{36}$		
	$\therefore v = -36$ cm	1	
	b) $h'=-\frac{v}{u}\times h$		
	$=-\frac{-36\text{cm}}{-18\text{cm}}\times 1.5 \text{ cm} = -3$ cm (Magnified Inverted image)	1	
	• If $u = -10$ cm No distinct image would be formed on the screen. In this case the image formed will be virtual (object will be within focal length)	1	
	• 	1	5

Q23.	• Power of lens – Ability of a lens to converge or diverge light rays/ Degree of convergence or divergence of light ray achieved by a lens/ Reciprocal of focal length of the lens)	1	
	• S. I. unit is dioptre	½	
	• Convex lens has positive power	½	
	• $v = +40$ cm ; $h' = h$ The lens is convex/ converging	1	
	Image is real, inverted and same sized $\therefore$ object is at 2F	½	
	$2f = 40$ cm $\quad \therefore f = 20$ cm $P = \frac{1}{f} = \frac{100}{20 \text{ cm}} = 5 \text{ dioptre}$	½	
	• 	1	5
Q24.	• i) Cornea – Refraction of the light rays falling on the eye. ii) Iris – To control the size of the pupil. iii) Pupil – To regulate and control the amount of light entering the eye. iv) Retina – To act as a screen to obtain the image of object and generate electrical signals which are sent to the brain via optic nerves.	½ × 4	
	• Ways of motivating people for the noble cause of eye donation street play, Banners, Poster, door to door campaign etc..		
	• Objectives – To develop the habit of group work To work for a common cause To understand social issues and problems.	3	5
	SECTION – B		
	25) C 26) D 27) C 28) A 29) D 30) B 31) D 32) B 33) A	1x9	9
Q34.	• Acetic acid is a colorless liquid.	½	
	It is miscible / soluble in water. (or any other physical property)	½	
	• On adding a pinch of sodium hydrogen carbonate, Brisk effervescence is observed.	½	
	Evolution of a colorless / odourless gas.	½	2
Q35.		2	2

Q36.	Inverted, magnified  	1 1	 2

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

Marking Scheme – Science (Foreign) 31/2/2

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.

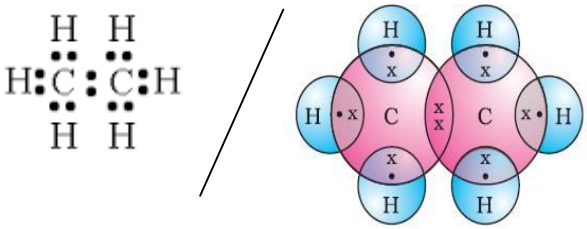
7. There should be no effort at 'moderation' of the marks by the evaluating teachers. The actual total marks obtained by the candidate may be of no concern of the evaluators.

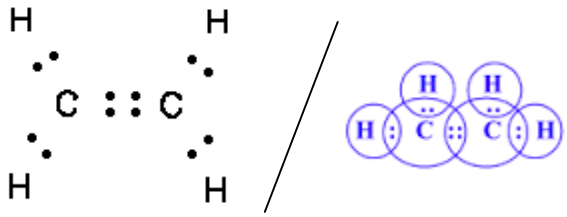
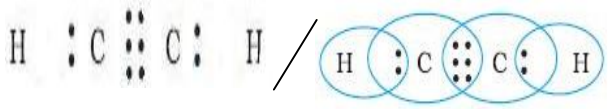
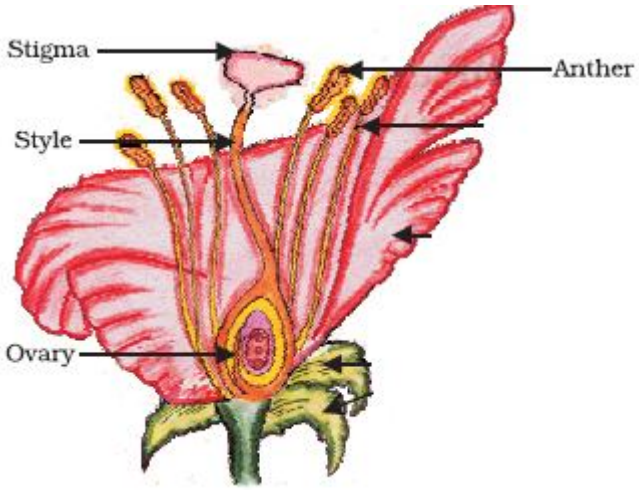
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.

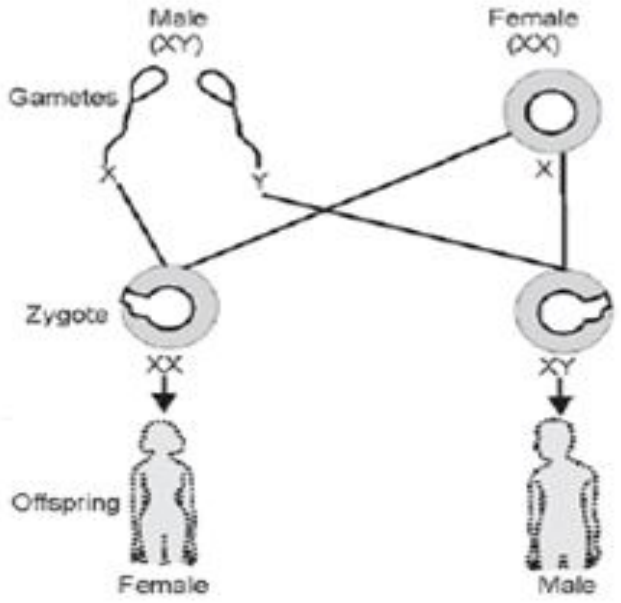
9. ½ mark may be deducted if a candidate either does not write units or writes wrong units in the final answer of a numerical problem.

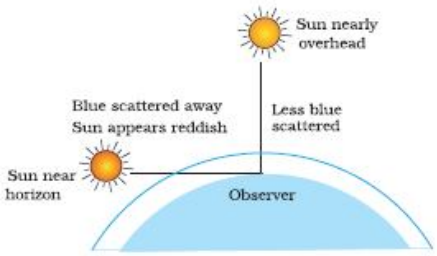
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

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 **SECTION – A**	Marks	Total
Q1.	(a) Alcohol (b) Ketone	½ ½	1
Q2.	Sepals / calyx Petals / Corolla Thalamus (any two)	½ ½	1
Q3.	Chloroflurocarbons (no marks if only CFCs mentioned)	1	1
Q4.	• Planets, being closer to earth, are seen as extended sources If we consider a planet as a collection of large number of point-sized sources of light, the total variation in the amount of light entering our eye due to gradual changing of refractive index of the atmosphere from all individual, point-sized sources will average out to zero. This nullifies the twinkling effect.	1 1	2
Q5.	1. Loss of biodiversity 2. Varied needs of the local people can no longer be met. 3. Degradation of soil or any other (any two)	1x 2	2
Q6.	1. Social problems 2. Economic problems 3. Environmental problems Solution: Adequate rehabilitation / compensation to the displaced persons / aforestation	½ x 3 ½	2
Q7.	• As all the members of a series have the same functional group, similar structure and same general formula. (any two) • CH_3OH , C_2H_5OH • The physical properties are determined by alkyl group / hydrocarbon part / part other than the functional group. • The chemical properties are determined by functional group such as -OH group, or any other example from any other homologous series.	½ , ½ ½ , ½ ½ ½	3
Q8.	i) Ethane: C_2H_6 	½ , ½	

	ii) Ethene: C_2H_4 	½ , ½	
	iii) Ethyne: C_2H_2 	½ , ½	3
Q9.	• For systematic and simplified study of elements and their compounds. • Basic property: Atomic Number. • Modern periodic Law: The properties of elements are a periodic function of their atomic number. • Metals are found on the left side and centre of the Modern Periodic Table. • Metalloids are found in a zig-zag manner between the metals and the non-metals. • Non-metals are found on the right side of the Modern Periodic Table.	½ ½ ½ ½ ½ ½	3
Q10.	***Note:*** Since the information given in the question is inaccurate, full marks are to be awarded to every candidate.	3	3
Q11.	DNA copying is essential because it makes possible the transmission of characters from parents to the next generation. Advantages of sexual reproduction over asexual reproduction – Sexual reproduction gives rise to variations; which are essential for evolution as well as well as survival of species under unfavorable conditions.	1 1+1	3
Q12.	 Drawing 4 correct labeling (i) Anther (ii) Ovary (iii) Stigma (iv) Style	1 ½ x 4	3
Q13.	• Placenta is a specialized tissue embedded in the uterine wall. It contains villi on the embryo's side and blood spaces on the mother's side. Function- helps in exchange of nutrients, gases and waste materials between the mother and embryo / foetus.	1×2 1	3

Q14.	a) i) Fossils showing imprints of feathers along with the bones in dinosaurs / reptiles found, ii) They could not fly and presumably using the feathers for insulation, iii) Later they developed / evolved and adapted feathers for flight. iv) Thus, they give evidence that birds have evolved from reptiles. b) No, the structure of the eye in each of these organisms is different / they have separate evolutionary origins.	½ x 4 ½, ½	3
Q15.	• Flow chart Parents  • Justification: Women produce only one type of ovum / (carrying X chromosome) and males produce two types of sperms (carrying either X or Y chromosome) in equal proportions. So the sex of a child is a matter of chance depending upon the type of sperm fertilizing the ovum.	½ ½ ½ ½ 1	3
Q16.	• Statement of two laws of refraction • $c = 3\times10^8$ m/s $\quad v = 1.4\times10^8$ m/s • $Absolute\ refractive\ index = \frac{Speed\ of\ light\ in\ vacuum}{Speed\ of\ light\ in\ medium}$ $= \frac{3\times10^8\ \text{m/s}}{1.4\times10^8\ \text{m/s}} = 2.14$	1 × 2 ½ ½	3
Q17.	• The fine particles in the atmosphere scatter light of shorter wavelength (blue color) more strongly than the light of longer wavelength (red color) ***OR***	1 ½	



- The sky would appear dark ½
- No atmosphere for scattering 1 — 3

Q18. Carbon has 4 electrons in its outermost shell .It cannot lose 4 electrons to form C^{4+} because very high energy is required to remove 4 electrons. 1 ½

It cannot gain 4 electrons to form C^{4-} ions because it is difficult for 6 protons to hold on to 10 electrons. 1 ½

- Ionic / Electrovalent Bonds , ½
- Covalent bonds. ½
- There are no charged particles in carbon compounds and hence poor conductors of electricity. 1 — 5

Q19.

- $h = +1.5$ cm; $f = -12$ cm; $u = -18$ cm $v = ?$ $h' = ?$

a) $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$ ½

$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{(-12)} - \frac{1}{(-18)}$ ½

$= \frac{-1}{12} + \frac{1}{18} = \frac{-3+2}{36} = \frac{-1}{36}$

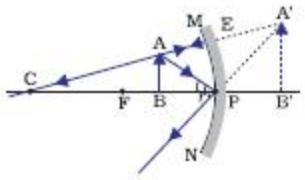
$\therefore v = -36$ cm 1

b) $h' = -\frac{v}{u} \times h$

$= -\frac{-36\text{cm}}{-18\text{cm}} \times 1.5 \text{ cm} = -3$ cm (Magnified Inverted image) 1

- If $u = -10$ cm

No distinct image would be formed on the screen. In this case the image formed will be virtual (object will be within focal length) 1

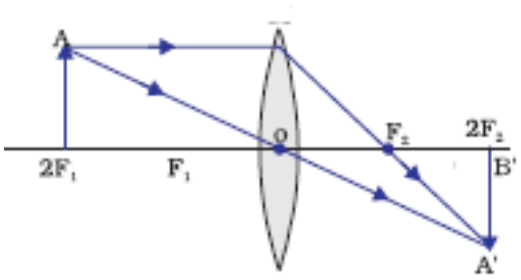
- 

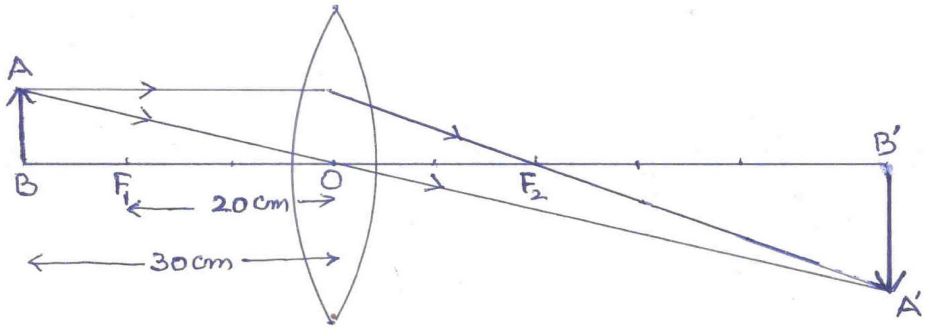
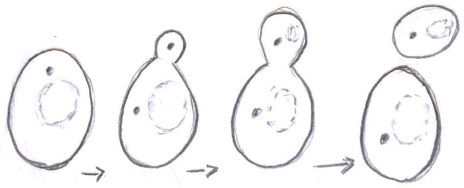
1 — 5

Q20.

- Power of lens – Ability of a lens to converge or diverge light rays/ Degree of convergence or divergence of light ray achieved by a lens/ Reciprocal of focal length of the lens) 1
- S. I. unit is dioptre ½
- Convex lens has positive power ½
- $v = +40$ cm ; $h' = h$

The lens is convex/ converging 1

	Image is real, inverted and same sized $\therefore$ object is at 2F $2f = 40$ cm $\quad \therefore f = 20$ cm $P = \frac{1}{f} = \frac{100}{20\text{ cm}} = 5\,\text{dioptre}$ • 	½ ½ 1	5
Q21.	• i) Cornea – Refraction of the light rays falling on the eye. ii) Iris – To control the size of the pupil. iii) Pupil – To regulate and control the amount of light entering the eye. iv) Retina – To act as a screen to obtain the image of object and generate electrical signals which are sent to the brain via optic nerves. • Ways of motivating people for the noble cause of eye donation street play, Banners, Poster, door to door campaign etc.. • Objectives – To develop the habit of group work To work for a common cause To understand social issues and problems.	½ × 4 3	5
Q22.	Carbon has 4 electrons in its outermost shell .It cannot lose 4 electrons to form C^{4+} because very high energy is required to remove 4 electrons. It cannot gain 4 electrons to form C^{4-} ions because it is difficult for 6 protons to hold on to 10 electrons. • Ionic / Electrovalent Bonds , • Covalent bonds. • There are no charged particles in carbon compounds and hence poor conductors of electricity.	1 ½ 1 ½ ½ ½ 1	5
Q23.	a) A – Stigma B –Pollen tube C – Ovary D – Female germ cell / Egg cell b) Pollination – Transfer of pollen grains from anther to the stigma of a flower. Significance of pollination – Process of pollination leads to fertilization as it brings the male and female gametes together for fusion. c) After a pollen falls on a suitable stigma, the pollen tube grows out of the pollen grain and travels through the style to reach the ovule in the ovary. Here the male germ cell (carried by the pollen tube) fuses with the female germ cell to form a zygote. i) Ovule ii) Ovary	½ x 4 ½ ½ 1 ½ ½	5

Q24.	Speciation - formation of new species from pre-existing ones.	1	
	Factors – 1) Mutations 2) Natural selection 3) Genetic drift 4) Geographical Isolation	½ x 4	
	Geographical isolation cannot be a major factor in the speciation of a self pollinating plant species.	1	
	Reason – physical barrier cannot be created in self pollinating plants.	1	5
	SECTION – B		
	25) D 26) B 27) B 28) A 29) A 30) D 31) C 32) D 33) C	1x9	9
Q34.	• Acetic acid is a colorless liquid. It is miscible / soluble in water. (or any other physical property) • On adding a pinch of sodium hydrogen carbonate, Brisk effervescence is observed. Evolution of a colorless / odourless gas.	½ ½ ½ ½	2
Q35.	Inverted, magnified 	1 1	2
Q36.		2	2

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

Marking Scheme – Science (Foreign) 31/2/3

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.

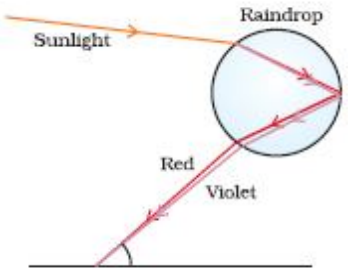
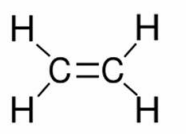
7. There should be no effort at 'moderation' of the marks by the evaluating teachers. The actual total marks obtained by the candidate may be of no concern of the evaluators.

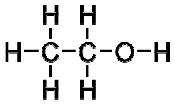
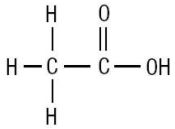
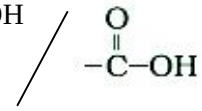
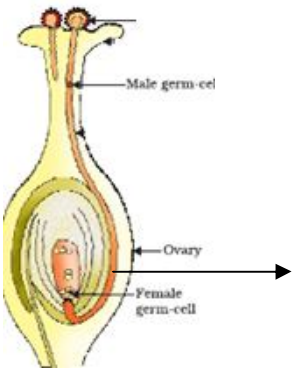
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.

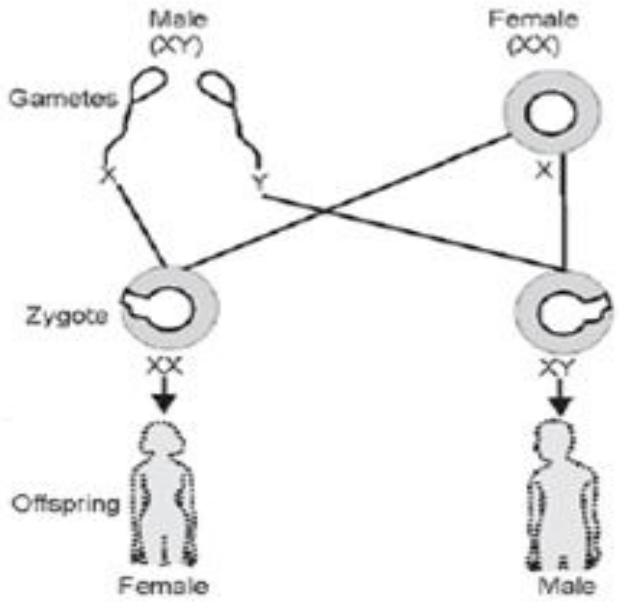
9. ½ mark may be deducted if a candidate either does not write units or writes wrong units in the final answer of a numerical problem.

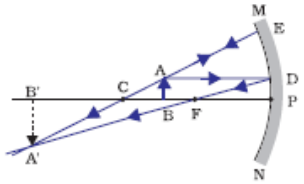
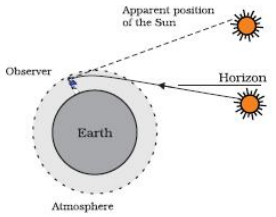
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

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 **SECTION – A**	Marks	Total
Q1.	Ethyne C_2H_2	½ ½	1
Q2.	DNA is the carrier of hereditary information from parents to the next generation / Hereditary material present in all living cells.	1	1
Q3.	Forests Ponds, Lakes (or any other) (any two)	½, ½	1
Q4.	Diagram  Labeling	1 1	2
Q5.	Two advantages - (i) Provides the resources for the present generation. (ii) Preserve the resources for the future generation as well. Reuse is better than recycling because it does not involve use of energy.	½ ½ ½ , ½	2
Q6.	Advantages of ground water – I. It does not evaporate. II. Spreads out to recharge wells. III. Provides moisture for vegetation over a large area. IV. Does not provide breeding ground for mosquitoes. V. Remain protected from contamination from human excreta, etc.. (any four)	½ × 4	2
Q7.	• Ethene  • Conc. H_2SO_4 acts as a dehydrating agent. • $CH_3CH_2OH \xrightarrow[443K]{Conc.H_2SO_4} C_2H_4 + H_2O$	½ ½ 1 1	3

Q8.	An atom or a group of atoms / heteroatoms which determine the chemical properties of an organic compound.	1	
	Name **Structural Formula** **Functional Group** Ethanol  -OH	½ , ½	
	Ethanoic acid  -COOH 	½ , ½	3
Q9.	Electronic configuration of Q : 2 , 8 , 3	½	
	Valency of Q : 3	½	
	Electronic configuration of R : 2 , 8 . 5	½	
	Valency of R : 8 – 5 = 3	½	
	Electronic config. of P : 2 , 8 , 1 Electronic config of S : 2 , 8 , 7		
	Formula : PS/ NaCl	1	3
Q10.			
	(i) E	½	
	(ii) B	½	
	(iii) C	½	
	(iv) B, because atomic radius decreases from left to right due to increase in the nuclear charge.	½ , ½	
	(v) Noble Gases	½	3
Q11.	 Ovule		
	Drawing	1	
	Four correct labeling, viz., ovary, male germ cell, female germ cell and ovule	½ x 4	3
Q12.	Three advantages of vegetative propagation – i) Plants which do not produce viable seeds can be produced by this method. ii) Plants raised by this method can bear flowers and fruits earlier than those produced from seeds. iii) The characters (traits) of the parent plant can be preserved by this method. iv) It is cheap, easier and more rapid method of propagation. v) Superior quality of plants can be obtained		
	(any three)	1 x 3	3

Q13.	• Placenta is a specialized tissue embedded in the uterine wall. It contains villi on the embryo's side and blood spaces on the mother's side.	1×2	
	Function- helps in exchange of nutrients, gases and waste materials between the mother and embryo / foetus.	1	3
Q14.	• Yes, it is possible.	1	
	Example – When pure tall pea plants are crossed with pure dwarf pea plants, only tall pea plants are obtained in F1 generation.	½	
	On selfing tall plants of F1, both tall and dwarf plants are obtained in F2 generation in the ratio 3:1.	½	
	Reappearance of the dwarf character, a recessive trait in F2 generation shows that the dwarf trait/ character was present in individuals of F1 but it did not express (due to the present of tallness, a dominant trait / character)	1	3
Q15.	• Flow chart		
	Parents	½	
		½ ½ ½	
	• Justification: Women produce only one type of ovum / (carrying X chromosome) and males produce two types of sperms (carrying either X or Y chromosome) in equal proportions. So the sex of a child is a matter of chance depending upon the type of sperm fertilizing the ovum.	1	3
Q16.	i) Concave mirror	½	
	ii) $u = -20$ cm; $v = -80$ cm; $m = ?$ $m = -\frac{v}{u} = -\frac{(-80\,\text{cm})}{(-20\,\text{cm})} = -4$	1	
	iii) $v - u = 60$ cm	½	

	iv) 	1	3
Q17.	• Due to atmospheric refraction, the sun is visible to us about two minutes before the actual sun-rise and about two minutes after the actual sun-set	1	
	• 	2	3
Q18.	• In a food chain the energy moves progressively through the various trophic levels and is no longer available to the organisms of the previous trophic level / energy captured by the autotrophs does not revert back to the solar input.	1	
	• Pesticides used for crop protection when washed away / down into the soil / water bodies absorbed by plants / producers.	1	
	• On consumption they enter our food chain and being non – biodegradable these chemicals get accumulated progressively and enter our body.	1	3
Q19.	Speciation - formation of new species from pre-existing ones.	1	
	Factors – 1) Mutations 2) Natural selection 3) Genetic drift 4) Geographical Isolation	½ x 4	
	Geographical isolation cannot be a major factor in the speciation of a self pollinating plant species.	1	
	Reason – physical barrier cannot be created in self pollinating plants.	1	5
Q20.	a) A – Stigma B –Pollen tube C – Ovary D – Female germ cell / Egg cell	½ x 4	
	b) Pollination – Transfer of pollen grains from anther to the stigma of a flower.	½	
	Significance of pollination – Process of pollination leads to fertilization as it brings the male and female gametes together for fusion.	½	
	c) After a pollen falls on a suitable stigma, the pollen tube grows out of the pollen grain and travels through the style to reach the ovule in the ovary. Here the male germ cell (carried by the pollen tube) fuses with the female germ cell to form a zygote.	1	
	i) Ovule ii) Ovary	½ ½	5

Q21.

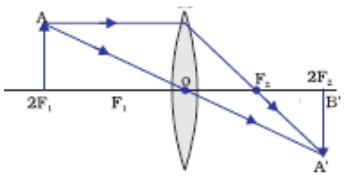
- Power of lens – Ability of a lens to converge or diverge light rays/ Degree of convergence or divergence of light ray achieved by a lens/ Reciprocal of focal length of the lens) — 1
- S. I. unit is dioptre — ½
- Convex lens has positive power — ½
- $v = +40$ cm ; $h' = h$

  The lens is convex/ converging — 1

  Image is real, inverted and same sized

  $\therefore$ object is at 2F — ½

  $2f = 40$ cm $\quad \therefore f = 20$ cm

  $$P = \frac{1}{f} = \frac{100}{20 \text{ cm}} = 5 \text{ dioptre}$$ — ½
- 

  — 1 — 5

Q22.

- $h = +1.5$ cm; $\quad f = -12$ cm; $\quad u = -18$ cm $\quad v = ?$ $\quad h' = ?$

a) $$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$ — ½

$$\therefore \frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{(-12)} - \frac{1}{(-18)}$$ — ½

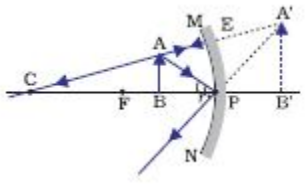
$$= \frac{-1}{12} + \frac{1}{18} = \frac{-3+2}{36} = \frac{-1}{36}$$

$\therefore v = -36$ cm — 1

b) $$h' = -\frac{v}{u} \times h$$

$$= -\frac{-36 \text{cm}}{-18 \text{cm}} \times 1.5 \text{ cm} = -3 \text{ cm}$$ (Magnified Inverted image) — 1

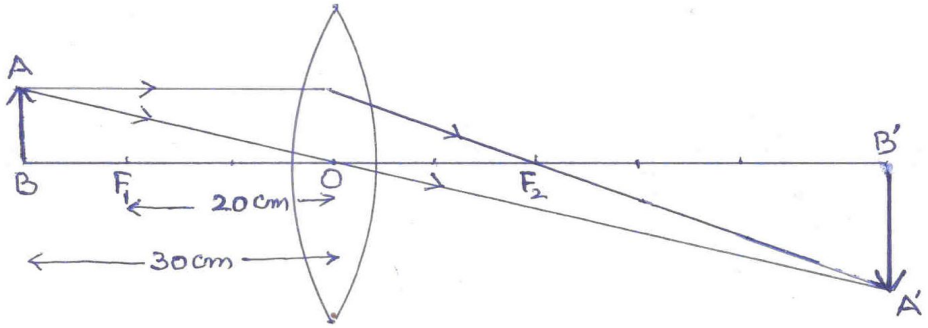
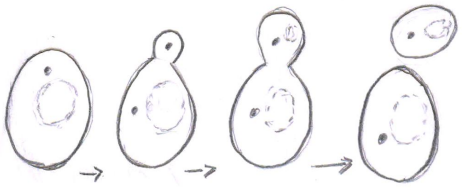
- If $u = -10$ cm

  No distinct image would be formed on the screen. In this case the image formed will be virtual (object will be within focal length) — 1
- 

  — 1 — 5

Q23.

- i) Cornea – Refraction of the light rays falling on the eye.
  ii) Iris – To control the size of the pupil.
  iii) Pupil – To regulate and control the amount of light entering the eye.
  iv) Retina – To act as a screen to obtain the image of object and generate electrical signals which are sent to the brain via optic nerves. — ½ × 4
- Ways of motivating people for the noble cause of eye donation street play, Banners, Poster, door to door campaign etc.. — 3

	• Objectives – To develop the habit of group work To work for a common cause To understand social issues and problems.		5
Q24.	Carbon has 4 electrons in its outermost shell .It cannot lose 4 electrons to form C^{4+} because very high energy is required to remove 4 electrons.	1 ½	
	It cannot gain 4 electrons to form C^{4-} ions because it is difficult for 6 protons to hold on to 10 electrons.	1 ½	
	• Ionic / Electrovalent Bonds ,	½	
	• Covalent bonds.	½	
	• There are no charged particles in carbon compounds and hence poor conductors of electricity.	1	5
	SECTION – B		
	25) B 26) D 27) A 28) B 29) C 30) C 31) D 32) D 33) A	1x9	9
Q34.	Inverted, magnified	1	
		1	2
Q35.	• Acetic acid is a colorless liquid.	½	
	It is miscible / soluble in water. (or any other physical property)	½	
	• On adding a pinch of sodium hydrogen carbonate, Brisk effervescence is observed.	½	
	Evolution of a colorless / odourless gas.	½	2
Q36.		2	2