Strictly Confidential- (For Internal and Restricted Use Only) **Secondary School Examination**
SUMMATIVE ASSESSMENT - II
March 2017

Marking Scheme – Science (Outside) 31/1, 31/2, 31/3

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

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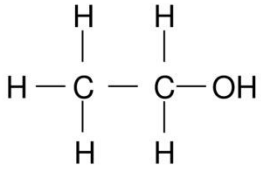
Summative Assessment II (March- 2017)
Marking Scheme
Class X – Outside Delhi Code No. 31/1

Q. No.	Expected Answer / Value point Section - A	Distribution of marks	Marks
1.	C_2H_6 , C_3H_8	½ + ½	1
2.	Creation of DNA copy / Replication / Copying of DNA	1	1
3.	1000000 J	1	1
4.	• Virtual • Erect • Diminished • On the same side as the object / or any other characteristic	½ x 4	2
5.	• Conserving forests helps in (i) retaining sub soil water and (ii) checking floods / any other • Conserving wild life helps in (i) maintaining ecological balance and (ii) protecting the nature (or any other)	½ x 4	2
6.	• Water stored during rainy season can be used as and when required by the community. • Ground water level increases due to recharging.	1 + 1	2
7.	 Ethene is produced $CH_3CH_2OH \xrightarrow[443K]{\text{Conc. } H_2SO_4} C_2H_4 + H_2O$ Conc. H_2SO_4 acts as a dehydrating agent.	1 ½ 1 ½	3
8.	Esterification – A process in which an alcohol and a carboxylic acid react in the presence of conc. H_2SO_4 to form an ester. $CH_3COOH + C_2H_5OH \xrightarrow{\text{Conc. } H_2SO_4} CH_3COOC_2H_5 + H_2O$	½ ½	

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	• Saponification – A process in which an ester reacts with sodium hydroxide to form sodium salt of an acid and alcohol / an ester reacts in the presence of an acid or a base to give back the alcohol and carboxylic acid. • $CH_3COOC_2H_5 + NaOH \longrightarrow C_2H_5OH + CH_3COONa$ • Esters are used in ice creams / perfumes • Saponification process is used in preparation of soap. •	½ ½ ½ ½	3
9.	• Periods – 7, Groups – 18 • Metallic character decreases along the period because effective nuclear charge increases on the valence electrons hence decrease in tendency to lose electrons. • Metallic character increases down a group because effective nuclear charge experienced by valence electrons decrease, hence tendency to lose electron decreases.	½ + ½ ½ + ½ ½ + ½	3
10.	• Aluminium (Al) Reason – Valency of Na is 1, Mg is 2, Al is 3 • Sodium (Na) Reason – As we move from left to right in a period, the atomic radius decreases / increase in nuclear charge pulls the electrons closer to the nucleus reducing the atomic size. • Sodium (Na) Reason – Reactivity decreases on moving from left to right in a period / any other reason	½ ½ ½ ½ ½ ½	3
11.	• For continuation of species / perpetuation of species • It promotes diversity of characters / helps to show the variations which enhances the survival chances. • Increases population of a species / any other answer	1 1 1	3
12.	• Vegetative propagation – A process in which any vegetative part of a plant (root, stem or leaf) gives rise to a new plant under appropriate conditions. • Two advantages :- (i) Large number of plants obtained in a short interval. (ii) Propagation of seedless plants is made possible / any other advantage. • Two disadvantages :- (i) No genetic variations, so, less • adaptability to the environment. (ii) The disease of plants gets transferred to the offsprings.	1 ½ ½ ½ ½	3
13.	• Three techniques – Barrier method, chemical method, surgical method • Chemical method • It maintains health of the woman, parents can provide more attention to children / more resources are available to the family / any other.	½ x 3 ½ ½ x 2	3

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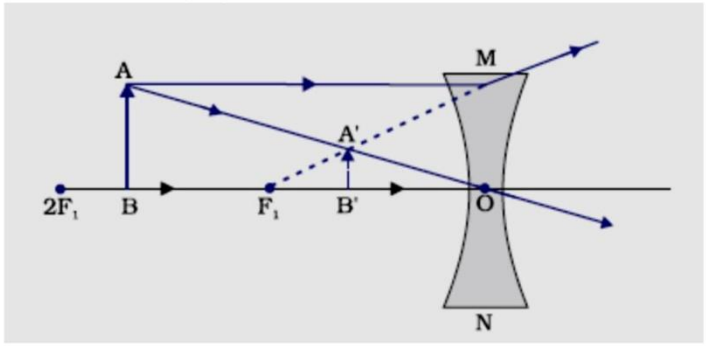
14.	• In Mendel's experiment, when pure tall pea plants were crossed with pure dwarf pea plants, only tall pea plants were obtained in F_1 generation. • On selfing the pea plants of F_1 generation both tall and dwarf pea plants were obtained in F_2 generation. • Reappearance of the dwarf pea plants in F_2 generation proves that the dwarf trait was inherited but not expressed in F_1 generation. Note:- If explained with flow chart with proper description, full marks be awarded.	1 1 1	3
15.	• Different life forms have evolved during the course of evolution. Classification deals with the grouping of these life forms into groups and sub groups based on similarities and differences. • The more characteristics any two species have in common, more closely they are related. • Thus classification helps in tracing the evolutionary relationship between the two organisms. Hence, evolution and classification are interlinked.	1 1 1	3
16.	Concave / diverging lens.  Direction of rays $f = \frac{1}{P}$, P = -10D, $f = \frac{1}{-10D}$ = - 0.1 m/-10 cm	½ 1 ½ ½ ½	3

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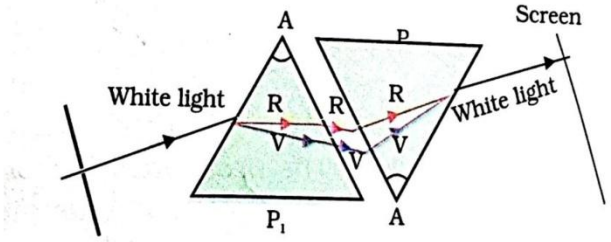
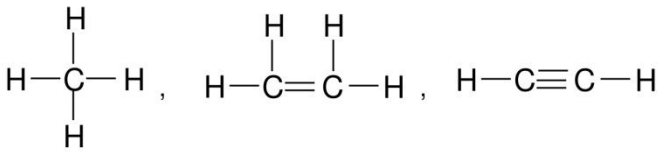
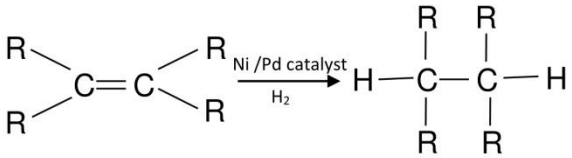
17.	Different colours of light bend through different angles with respect to the incident ray / different speed of different colours of light in glass / different values of refractive index of glass for different colours of light.  Direction of ray & labelling	1 1 ½ + ½	3
18.	a) Two ways of creating awareness • Door to door campaigning • Nukkad natak / any other method. b) Rain water harvesting with explanation / preventing over extraction of underground water / any other method	1 + 1 ½ + ½	3
19.	• Compounds of hydrogen and carbon • Alkanes – C_nH_{2n+2} • Alkenes – C_nH_{2n} • Alkynes – C_nH_{2n-2} • .  • Addition reaction / hydrogenation  	½ ½ ½ ½ ½ x 3 ½ 1	5

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20.	(a) Functions : (I) Ovary:- (i) Production of female hormones / estrogen / progesterone (ii) Production of female gamete/egg/ germ cells • (II) Uterus:- (i) Implantation of zygote / embryo (ii) Nourishment of developing embryo • (III) Fallopian tube :- (i) Transfer of female gamete from the ovary (ii) Site of fertilisation (b) Structure of placenta :- It is a special disc like tissue embedded in mother's uterine wall and connected to the foetus / embryo. Functions of placenta :- It provides a large surface area for glucose and oxygen / nutrients to pass from mother's body to the developing / developed embryo / foetus and also helps in passing the waste from the foetus / embryo to the mother's body.	½ + ½ ½ + ½ ½ + ½ 1 1	5
21.	• Acquired traits – Traits which develop in the life time of an individual and do not pass to the progeny. Example- Learning a skill such as dance / music / loss of body parts / weight / any other example. • Inherited traits – Traits present in the gamete / germ cells which can be seen in the progeny. Example – Skin colour / eyebrows / any other example. • Reasons – Traits / characteristics acquired during one's life time do not bring any change in the DNA of the reproducing cells / germ cells. Examples - Decrease in body weight of beetles due to starvation do not pass on to the next generation because there is no change in the germ cells of beetles.	1 ½ 1 ½ 1 1	5

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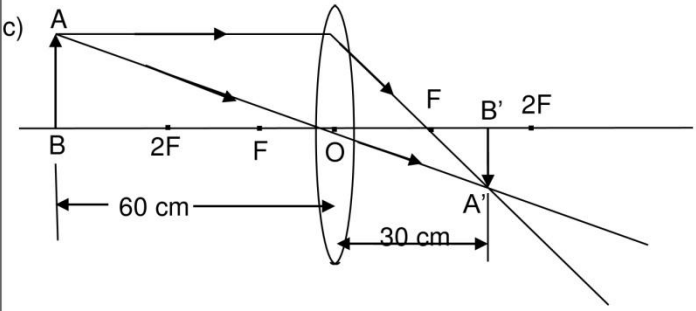
22.	a) f = 20 cm Sl. No. 3, Since u=-40 cm and v= +40 cm, it may be concluded that object is at 2F b) Sl. No. 6 When u= -15 cm, the object is between optical centre and principal focus. So image is virtual and it forms on the same side as the object. Hence, v should be –ve, but here it is +ve (+120 cm) c)  Direction of rays Magnification ,m = $\frac{v}{u} = \frac{30\ cm}{-60\ cm}$ = - 0.5 / - $\frac{1}{2}$	½ 1 ½ 1 1 ½ ½	5

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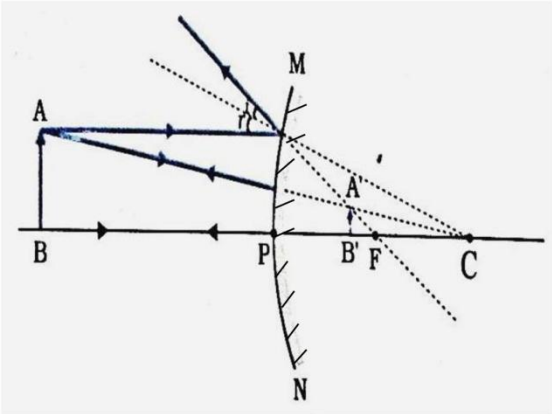
23.	a) Convex / diverging mirror)  Direction of rays Use:- As a rear view mirror / any other use Reason :- Always give erect and diminished image / Large field of view (b) The radius of the sphere of which the mirror forms a part / The distance between pole and center of curvature of a mirror. Nature of the mirror – convex / diverging mirror R = 2f = 24 cm ∴ f = +12 cm	½ 1 ½ ½ ½ ½ ½ ½	5

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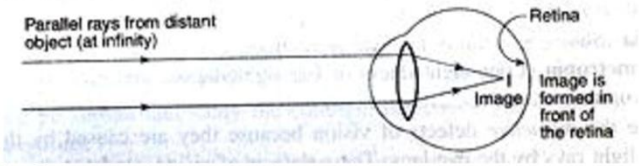
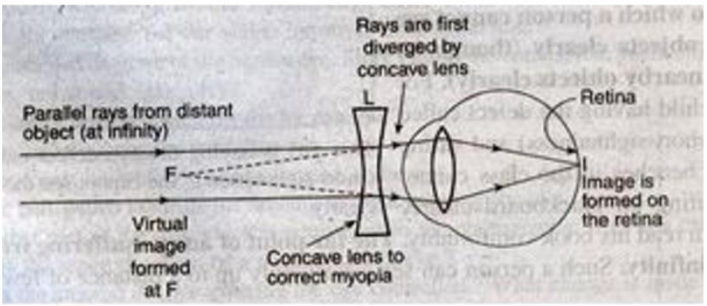
24.	a) • excessive curvature of the eye lens • elongation of the eyeball i)  ii) Concave / diverging lens  b) f = – 5 m (since lens is concave) $P = \frac{1}{f(\text{metre})}$ P= – 0.2 D	½ ½ 1 ½ 1 ½ ½ ½	5
	Section - B		
25.	D	1	
26.	C	1	
27.	D	1	
28.	B	1	
29.	C	1	
30.	D	1	
31.	D	1	
32.	B	1	
33.	C	1	9

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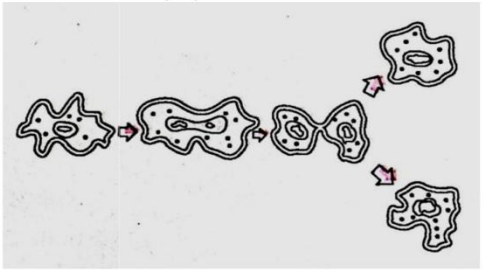
34.	• Vegetable oil / fat and sodium hydroxide • Red litmus paper turns blue.	1 1	2
35.		½ x 4	2
36.	a) Note: For part (a) ½ mark to be awarded to every student b) Size of the image increases c) Intensity / brightness of the image decreases d) No distinct image is formed. Only a patch of light is seen.	½ ½ ½ ½	2

Outside Delhi -31/1

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Summative Assessment II (March- 2017)
Marking Scheme
Class X – Outside Delhi Code No. 31/2

Q. No.	Expected Answer / Value point Section – A	Distribution of marks	Marks
1.	C_3H_6, C_4H_8	½ + ½	1
2.	If there is error in DNA copying / inaccuracies in DNA copying.	1	1
3.	5 J	1	1
4.	• Virtual • Erect • Enlarged • On the same side as the object	½ x 4	2
5.	• So that the resources reach every individual or has equal rights on usage of resources. • It also avoids division of society / to maintain social balance / equilibrium. • Forces against it – More exploitation by industrialists for developmental activities/ over use of resources by greedy people, black marketeers. (any other)	½ ½ ½ + ½	2
6.	• Forests help in preventing soil erosion / protect biodiversity / maintain ground water level / help in rainfall / provide raw materials / prevent floods / (any other two points). • Exploitation by industries / increase in population / urbanization / cattle grazing / (any other two points)	½ + ½ ½ + ½	2
7.	• Periods – 7, Groups – 18 • Metallic character decreases along the period because effective nuclear charge increases on the valence electrons hence decrease in tendency to lose electrons. • Metallic character increases down a group because effective nuclear charge experienced by valence electrons decrease, hence tendency to lose electron decreases.	½ + ½ ½ + ½ ½ + ½	3
8.	• Aluminium (Al) Reason – Valency of Na is 1, Mg is 2, Al is 3 • Sodium (Na) Reason – As we move from left to right in a period, the atomic radius decreases / increase in nuclear charge pulls the electrons closer to the nucleus reducing the atomic size.	½ ½ ½ ½	

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9.	• Sodium (Na) Reason – Reactivity decreases on moving from left to right in a period / any other reason • $C_2H_5OH + 3O_2 \longrightarrow 2CO_2 + 3H_2O$ • $CH_3CH_2OH \xrightarrow[\Delta 443K]{\text{Conc. } H_2SO_4} C_2H_4 + H_2O$ • $2C_2H_5OH + 2Na \longrightarrow 2C_2H_5ONa + H_2$	½ ½ 1 1 1	3 3
10.	• Esterification – A process in which an alcohol and a carboxylic acid react in the presence of conc. H_2SO_4 to form an ester. $CH_3COOH + C_2H_5OH \xrightarrow{\text{Conc. } H_2SO_4} CH_3COOC_2H_5 + H_2O$ Activity – • Take 1 mL of ethanol mixed with 1 mL of acetic acid along with few drops of conc. H_2SO_4 in a test tube. • Warm it for 5 min. in a water bath • Pour the contents in a beaker containing 20 – 50 mL of water and smell the resulting mixture. • It will give a fruity smell indicating the formation of ester.	½ 1 1½	3
11.	• These are not passed because the changes do not occur in the germ cells. Example- Learning a skill such as dance / music, loss of body parts / weight / any other example. (Any two) • These traits can be passed to the next generation when the changes are in the DNA of the germ cells.	1 ½ + ½ 1	3
12.	• Different life forms have evolved during the course of evolution. Classification deals with the grouping of these life forms into groups and sub groups based on similarities and differences. • The more characteristics any two species have in common, more closely they are related. • Thus classification helps in tracing the evolutionary relationship between the two organisms. Hence, evolution and classification are interlinked.	1 1 1	3

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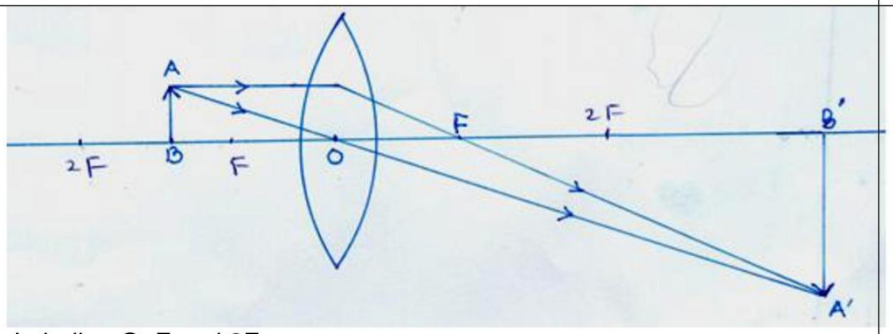
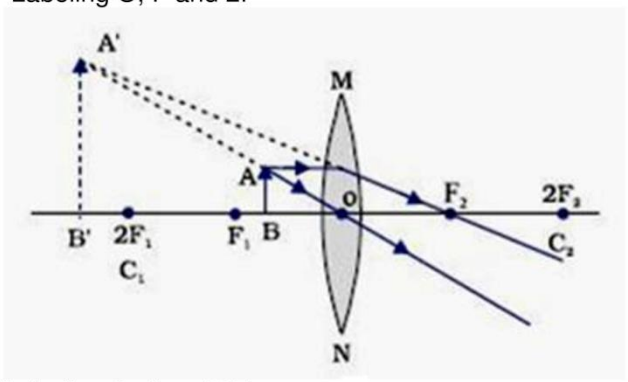
Q. No.	Expected Answer / Value point Section – A	Distribution of marks	Marks
13.	• For continuation of species / perpetuation of species • It promotes diversity of characters / helps to show the variations which enhances the survival chances. • Increases population of a species / any other answer	1 1 1	3
14.	• Rhizopus have sporangia which contain spores / Diagram :- ½, labeling:- ½ • When sporangia bursts the spores are liberated out. • They contain protective thick wall to tide over unfavourable conditions. • On return of the favourable conditions, spores germinate to grow into rhizopus.	1 ½ ½ 1	3
15.	• Three techniques – Barrier method, chemical method, surgical method • Chemical method • It maintains health of the woman, parents can provide more attention to children / more resources are available to the family / any other.	½ x 3 ½ ½ x 2	3
16.	 Labeling O, F and 2F  Labeling O, F and 2F	1 ½ 1 ½	3

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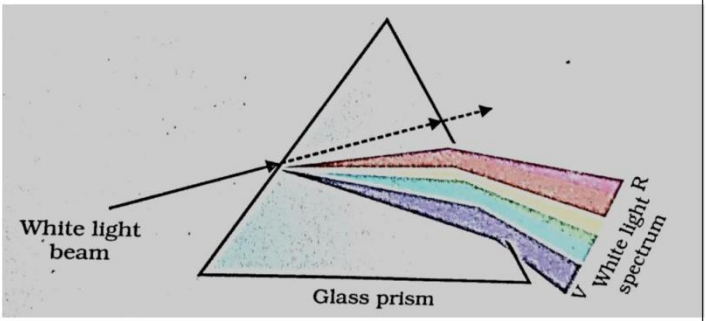
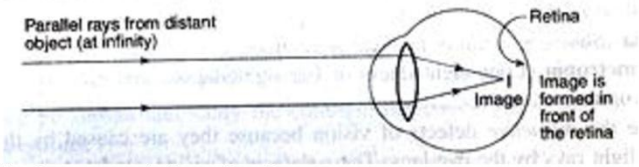
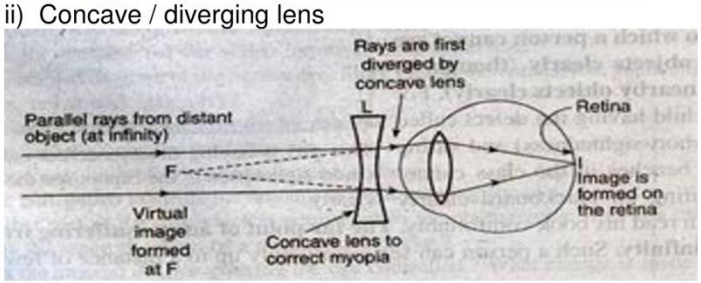
Q. No.	Expected Answer / Value point Section – A	Distribution of marks	Marks
17.	• Splitting of white light into component /seven colours. • Cause – Different colours of light bend through different angles w.r.t. incident ray as they pass through prism / any other cause.  	1 1 1	3
18.	a) Two ways of creating awareness • Door to door campaigning • Nukkad natak / any other method. b) Rain water harvesting with explanation / preventing over extraction of underground water / any other method	1 + 1 ½ + ½	3
19.	a) • excessive curvature of the eye lens • elongation of the eyeball i)  ii) Concave / diverging lens  b) f = — 5 m (since lens is concave) $P = \frac{1}{f(\text{metre})}$ P= — 0.2 D	½ ½ 1 ½ 1 ½ ½ ½	5
20.	a) f = 20 cm Sl. No. 3, Since u=-40 cm and v= +40 cm, it may be	½ 1	

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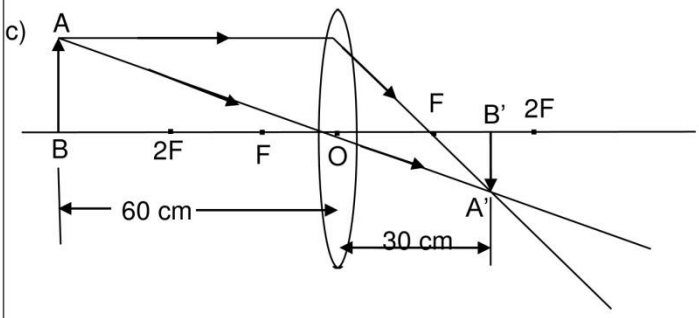
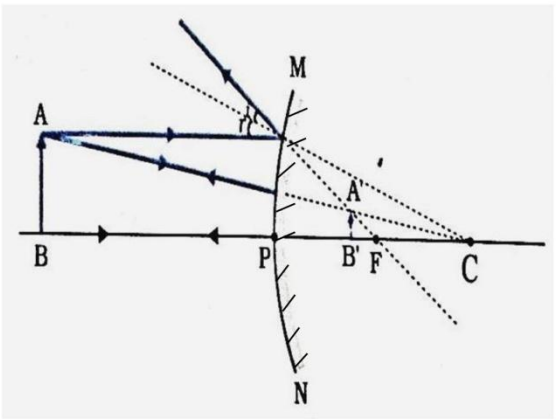
	concluded that object is at 2F b) Sl. No. 6 When u= -15 cm, the object is between optical centre and principal focus. So image is virtual and it forms on the same side as the object. Hence, v should be –ve, but here it is +ve (+120 cm) c)  Direction of rays Magnification ,m = $\frac{v}{u} = \frac{30\ cm}{-60\ cm}$ = - 0.5 / - $\frac{1}{2}$	½ 1 1 ½ ½	5
21.	a) Convex / diverging mirror)  Direction of rays Use:- As a rear view mirror any other use Reason :- Always give erect and diminished image / Large field of view	½ 1 ½ ½ ½ ½	

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	(b) The radius of the sphere of which the mirror forms a part / The distance between pole and center of curvature of a mirror. Nature of the mirror – convex / diverging mirror R = 2f = 24 cm ∴ f = +12 cm	½ ½ ½	5
22.	• Acquired traits – Traits which develop in the life time of an individual and do not pass to the progeny. Example- Learning a skill such as dance / music / loss of body parts / weight / any other example. • Inherited traits – Traits present in the gamete / germ cells which can be seen in the progeny. Example – Skin colour / eyebrows / any other example. • Reasons – Traits / characteristics acquired during one's life time do not bring any change in the DNA of the reproducing cells / germ cells. Examples - Decrease in body weight of beetles due to starvation do not pass on to the next generation because there is no change in the germ cells of beetles.	1 ½ 1 ½ 1 1	5
23.	(a) Functions : (I) Ovary:- (i) Production of female hormones/estrogen/ progesterone (ii) Production of female gamete/egg/ germ cells • (II) Uterus:- (i) Implantation of zygote / embryo (ii) Nourishment of developing embryo • (III) Fallopian tube :- (i) Transfer of female gamete from the ovary (ii) Site of fertilisation (b) Structure of placenta :- It is a special disc like tissue embedded in mother's uterine wall and connected to the foetus / embryo. Functions of placenta :- It provides a large surface area for glucose and oxygen / nutrients to pass from mother's body to the developing / developed embryo / foetus and also helps in passing the waste from the foetus / embryo to the mother's body.	½ + ½ ½ + ½ ½ + ½ 1 1	5
24.	• Compounds of hydrogen and carbon • Alkanes – C_nH_{2n+2} • Alkenes – C_nH_{2n} • Alkynes – C_nH_{2n-2}	½ ½ ½ ½	

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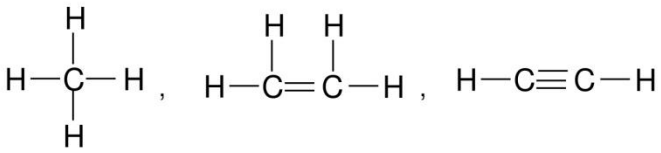
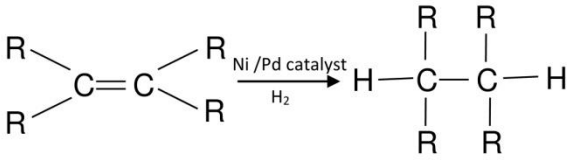
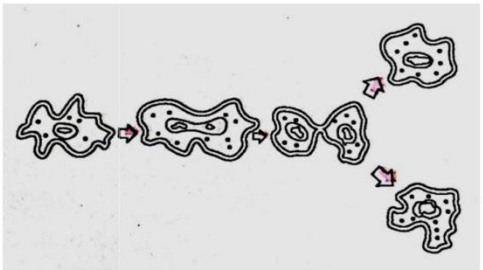
	• .  ½ x 3 • Addition reaction / hydrogenation ½  1		5
25.	D	1	
26.	C	1	
27.	D	1	
28.	C	1	
29.	B	1	
30.	D	1	
31.	D	1	
32.	B	1	
33.	C	1	9
34.	a) Note: For part (a) ½ mark to be awarded to every student b) Size of the image increases c) Intensity / brightness of the image decreases d) No distinct image is formed. Only a patch of light is seen.	½ ½ ½ ½	2
35.	• Vegetable oil / fat and sodium hydroxide • Red litmus paper turns blue.	1 1	2
36.	 ½ x 4		2

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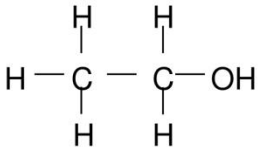
Summative Assessment II (March- 2017)
Marking Scheme
Class X – Outside Delhi — Code No. 31/3

Q. No.	Expected Answer / Value point Section – A	Distribution of marks	Marks
1.	C_3H_4, C_4H_6	½ + ½	1
2.	Survival advantage / survival of species over time	1	1
3.	2 J	1	1
4.	• Virtual • Diminished • Erect • Same side of the object / formed between F and O	½ x 4	2
5.	• Using public transport / limited use of fossil fuels / bicycles to go to short distances / rain water harvesting / any other activity.	½ x 4	2
6.	• Coal and petroleum are obtained from nature. • They are non-renewable resources which cannot be renewed within a short period of time.	1 1	2
7.	Esterification – A process in which an alcohol and a carboxylic acid react in the presence of conc. H_2SO_4 to form an ester. $CH_3COOH + C_2H_5OH \xrightarrow{\text{Conc. } H_2SO_4} CH_3COOC_2H_5 + H_2O$ • Saponification – A process in which an ester reacts with sodium hydroxide to form sodium salt of an acid and alcohol / an ester reacts in the presence of an acid or a base to give back the alcohol and carboxylic acid. • $CH_3COOC_2H_5 + NaOH \longrightarrow C_2H_5OH + CH_3COONa$ • Esters are used in ice creams / perfumes Saponification process is used in preparation of soap	½ ½ ½ ½ ½ ½	3
8.	 Ethene is produced $CH_3CH_2OH \xrightarrow[443K]{\text{Conc. } H_2SO_4} C_2H_4 + H_2O$ Conc. H_2SO_4 acts as a dehydrating agent.	1 ½ 1 ½	3

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9.	• Repetition of similar properties of elements after regular intervals. • Because of the same number of valence electrons. • It increases due to increase in effective nuclear charge which pulls the electrons towards it.	1 1 1	3
10.	• X(20) – 2, 8, 8, 2 • Y(17) – 2, 8, 7 • XY_2 • $\ddot{X} + 2\,\ddot{Y}: \;=\; X^{2+}\,[\,:\ddot{Y}:\,]^{2-}$ • Ionic / electrovalent bond	½ ½ ½ ½ + ½ ½	3
11.	• In Mendel's experiment, when pure tall pea plants were crossed with pure dwarf pea plants, only tall pea plants were obtained in F_1 generation. • On selfing the pea plants of F_1 generation both tall and dwarf pea plants were obtained in F_2 generation. • Reappearance of the dwarf pea plants in F_2 generation proves that the dwarf trait was inherited but not expressed in F_1 generation. Note:- If explained with flow chart with proper description, full marks be awarded.	1 1 1	3
12.	• A sequence of gradual changes which take place in the organism over millions of years resulting in the formation of new organisms / species. • Evolution is not progress from lower form of life to higher. It has given rise to more complex body design even while simpler body designs continue to flourish. • You may take an example of human beings who have not evolved from chimpanzees, but both have common ancestors.	1 1 1	3
13.	• Sexual reproduction, asexual reproduction • Sexual reproduction is responsible for bringing in more variations. • Because of process of DNA copying which may result in some error in it. • Because it involves fusion of male and female gametes from two different parents.	½ ½ 1 1	3

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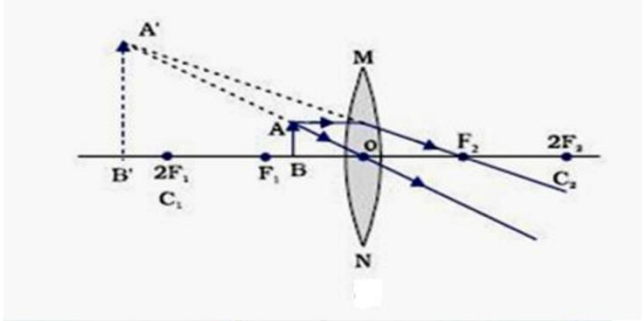
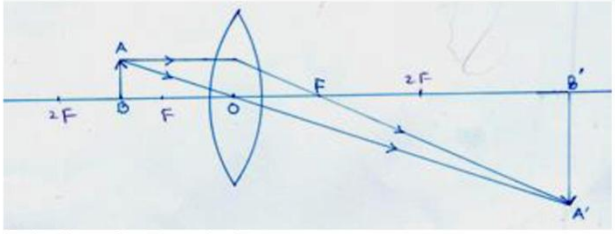
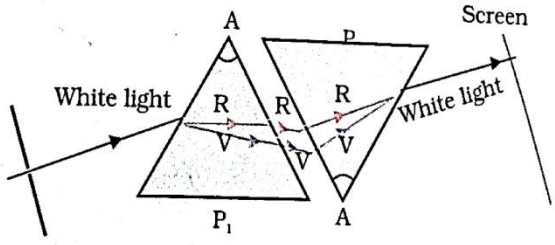
14.	• Vegetative propagation – A process in which any vegetative part of a plant (root, stem or leaf) gives rise to a new plant under appropriate conditions. • Two advantages :- (i) Large number of plants obtained in a short interval. (ii) Propagation of seedless plants is made possible / any other advantage. • Two disadvantages :- (i) No genetic variations, so, less • adaptability to the environment. (ii) The disease of plants gets transferred to the offsprings.	1 ½ ½ ½ ½	3
15.	• Three techniques – Barrier method, chemical method, surgical method • Chemical method • It maintains health of the woman, parents can provide more attention to children / more resources are available to the family / any other.	½ x 3 ½ ½ x 2	3
16.	  Labeling O, F and 2F Type of lens: Convex / Converging	1 1 ½ ½	3
17.	• Splitting of white light into seven colours. •  • Because the refraction / bending produced by second prism is equal to the refraction / bending produced by the first prism.	1 1 1	3

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18.	a) Two ways of creating awareness • Door to door campaigning • Nukkad natak / any other method. b) Rain water harvesting with explanation / preventing over extraction of underground water / any other method	1 + 1 ½ + ½	3
19.	• Acquired traits – Traits which develop in the life time of an individual and do not pass to the progeny. Example- Learning a skill such as dance / music / loss of body parts / weight / any other example. • Inherited traits – Traits present in the gamete / germ cells which can be seen in the progeny. Example – Skin colour / eyebrows / any other example. • Reasons – Traits / characteristics acquired during one's life time do not bring any change in the DNA of the reproducing cells / germ cells. Examples - Decrease in body weight of beetles due to starvation do not pass on to the next generation because there is no change in the germ cells of beetles.	1 ½ 1 ½ 1 1	5
20.	(a) Functions : (I) Ovary:- (i) Production of female hormones / estrogen / progesterone (ii) Production of female gamete/egg/ germ cells • (II) Uterus:- (i) Implantation of zygote / embryo (ii) Nourishment of developing embryo • (III) Fallopian tube :- (i) Transfer of female gamete from the ovary (ii) Site of fertilisation (b) Structure of placenta :- It is a special disc like tissue embedded in mother's uterine wall and connected to the foetus / embryo. Functions of placenta :- It provides a large surface area for glucose and oxygen / nutrients to pass from mother's body to the developing / developed embryo / foetus and also helps in passing the waste from the foetus / embryo to the mother's body.	½ + ½ ½ + ½ ½ + ½ 1 1	5

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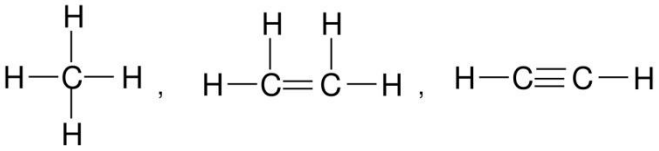
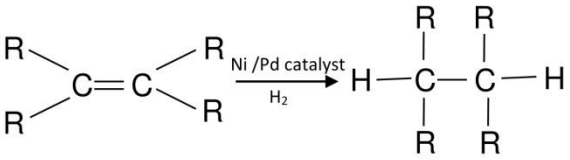
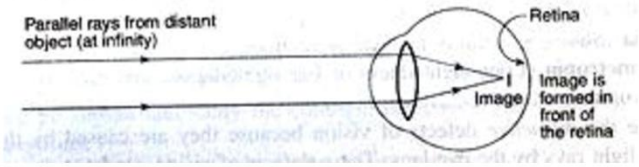
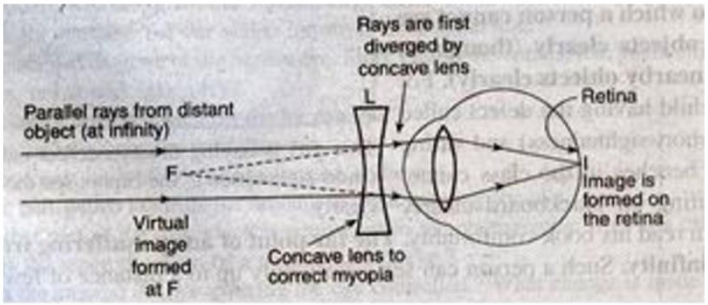
21	• Compounds of hydrogen and carbon • Alkanes – C_nH_{2n+2} • Alkenes – C_nH_{2n} • Alkynes – C_nH_{2n-2} • .  • Addition reaction / hydrogenation 	½ ½ ½ ½ ½ x 3 ½ 1	5
22.	a) • excessive curvature of the eye lens • elongation of the eyeball i)  ii) Concave / diverging lens  b) f = – 5 m (since lens is concave) $P = \frac{1}{f(\text{metre})}$ P= – 0.2 D	½ ½ 1 ½ 1 ½ ½ ½	5

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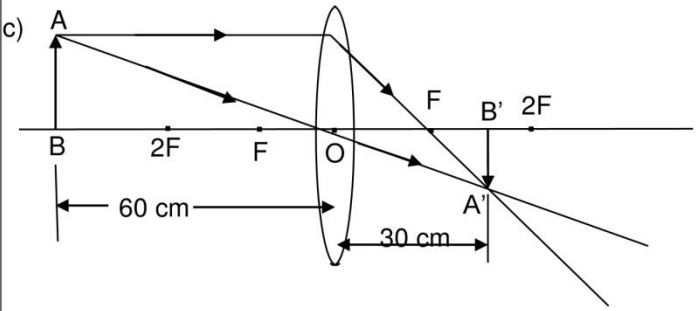
23.	a) f = 20 cm Sl. No. 3, Since u=-40 cm and v= +40 cm, it may be concluded that object is at 2F b) Sl. No. 6 When u= -15 cm, the object is between optical centre and principal focus. So image is virtual and it forms on the same side as the object. Hence, v should be –ve, but here it is +ve (+120 cm) c)  Direction of rays Magnification ,m = $\frac{v}{u} = \frac{30\ cm}{-60\ cm}$ = - 0.5 / - $\frac{1}{2}$	½ 1 ½ 1 1 ½ ½	5

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