Strictly Confidential- (For Internal and Restricted Use Only) **Secondary School Examination**
SUMMATIVE ASSESSMENT - II
March 2016

Marking Scheme – Science (Outside Delhi) 31/1

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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.

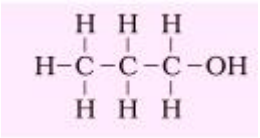
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.

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.

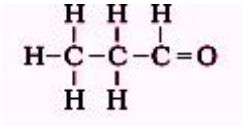
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

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.

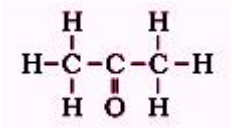
MARKING SCHEME **Code No. 31/1**
CLASS X – OUTSIDE DELHI

	Expected Answer/ Value point	Marks	Total
	SECTION – A		
Q1.	Propanol,  OR $CH_3CH_2CH_2OH$	½, ½	1
Q2.	Its filament breaks up into smaller fragments or pieces, and each fragment grows into a new filament/individual.	½, ½	1
Q3.	Ultraviolet rays from the sun penetrate down the earth and cause health hazards/skin cancer in human beings	1	1
Q4.	• Concave Mirrors / Converging Mirrors • When a solar furnace is placed at the focus of a large concave mirror/ reflector, it focuses a parallel beam of light on the furnace, consequently a high temperature is achieved after some time.	½ 3 x ½	2
Q5.	• Chipko Andolan (Hug the Trees Movement) – Women of Reni village in Garhwal hugged the tree trunks preventing the contractors from felling the trees. • This Andolan quickly spread to other parts of the country and forced the government to rethink their priorities in the use of forest produce, consequently the local people benefitted. • The environment was saved from permanent damage/ affected the quality of soil and the sources of water.	1 ½, ½	2
Q6.	Burning of fossil fuels produces green house gases(CO , CO_2,water vapour, oxides of nitrogen, sulphur). High concentration of CO_2 causes global warming.	1, 1	2
Q7.	$2CH_3COOH + 2Na \rightarrow 2CH_3COONa + H_2$		
a)	Sodium ethanoate/ Sodium acetate	½, ½	
b)	$CH_3COOH + NaOH \longrightarrow CH_3COONa + H_2O$ Sodium ethanoate/ sodium acetate	½, ½	
c)	$CH_3COOH + C_2H_5OH \longrightarrow CH_3COOC_2H_5 + H_2O$ Ethyl ethanoate/ ester	½, ½ ½, ½	3

Q8. • Propanal (aldehyde) ; ½, ½



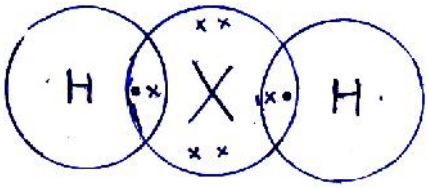
• Propanone(ketone); ½, ½



• Isomers(same molecular formula but different structural formula/different functional group) 1 3

Q9. • Electronic Configuration of X – 2,8,6
Valence electrons – 6
Valency = 8-6= 2 ½, ½

• Formula with hydrogen- H_2X or H_2S



½ , ½

Sulphur ; NonMetal ½, ½ 3

Q10. Atomic number of X = Mass number of X – No of neutrons ½

= 35 – 18 = 17 ½

Therefore Electronic configuration of X = 2,8.7 ½

Group number =17 ½

Period no = 3

Valency = 8-7 = 1 ½ , ½ 3

Q11. Reproduction – It is a (biological) process by which new individuals of the same species are produced by the existing organisms 1

- Populations of organisms live in well defined places called niches in the ecosystem using their ability to reproduce. ½
- Reproduction involves DNA copying which is the source of information for making proteins thereby controlling body design ½
- These body designs allow the organism to use a particular niche for the stability of the population of a species ½
- (Minor) variations may also lead to the stability of the species ½ 3

Q12. Regeneration- It is the ability of an organism to give rise to a new organism/ individual from their body parts 1

Regeneration in hydra-

- When the body of hydra by any means is cut into number of pieces ½
- Each piece contains specialized cells ½
- These cells proliferate and make large number of cells ½
- From this mass of cells different cells undergo changes to become various cell types and tissues finally developing into a new organism ½ 3

Q13. a) i) Involvement of two different individuals
ii) Creation of new combination of variants ½, ½

b) i) pollen/pollen grain
ii) by pollination/ agents of pollination
iii) It (pollen tube) helps male gamete to reach egg (ovule)
iv) Converts into embryo 4 x ½ 3

Q14.

- When a cross was made between a tall pea plant with round seeds and a short pea plant with wrinkled seeds, the F1 progeny plants are all tall with round seeds: this indicates that tallness and round seeds are the dominant traits. 1
- When the F1 plants are self pollinated the F2 progeny consisted of some tall plants with round seeds and some short plants with wrinkled seeds which are the parental traits 1
- There were also some new combinations like tall plants with wrinkled seeds and short plants with round seeds ½
- Thus it may be concluded that tall and short traits and round and wrinkled seed traits have been inherited independently ½ 3

OR

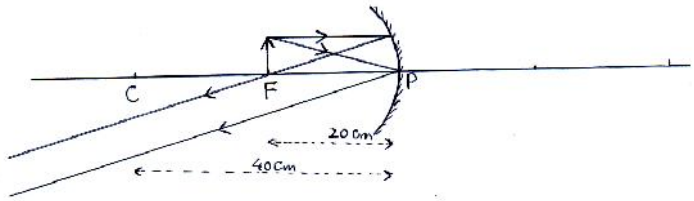
A flow chart depicting the same

Note: Any other contrasting characters can also be taken

Q15.

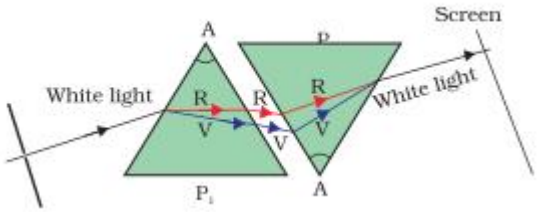
- Different forms of organisms/ life have evolved during the course of evolution, and classification deals with grouping of these organisms into groups and subgroups based on their similarities and differences. ½ , ½
- The more characteristics any two species have in common more closely they are related/ will have a more recent ancestor(and vice versa) 1
- Thus classification helps tracing the evolutionary relationships between the two organisms hence classification and evolution are interlinked. 1 3

Q16. Object position: At C (Centre of curvature) ½
Object distance = 40 cm ½
Position of the image - at infinity ½
Reason – Focal length of the mirror = 20 cm
If the object is moved 20 cm towards the mirror then its new position would be at the focus of the mirror. ½



(deduct ½ mark if arrows are missing/ not marked) 1 3

Q17. Description of activity- When a glass prism is used to obtain a spectrum of sunlight, a second identical prism in an inverted position with respect to the first position will allow all the colours of spectrum to recombine .Thus a beam of white light will emerge from the other side of the second prism. 1 ½



1 ½ 3

Q18 Two reasons for the conservation of the environment:

(a) 1) To save air, water and soil from pollution
2) To maintain ecological balance in nature 2 x ½

(b) Green dustbins- for biodegradable waste, and blue dustbins for non biodegradable waste for proper disposal of waste without wasting time and energy in segregating the biodegradable and non - biodegradable wastes 2 x ½

(c) Values – cooperative spirit, concern about environment, civic sense
Or any other (Any two) 2 x ½ 3

Q19. P= Ethanol/C_2H_5OH Q= Ethene/$CH_2=CH_2$ R=Ethane/ C_2H_6 3x ½

$C_2H_5OH \xrightarrow[443k]{\text{Conc } H_2SO_4} CH_2=CH_2 + H_2O$
Ethane Ethene 1 ½

$CH_2=CH_2 \xrightarrow[H_2]{\text{Nickel Catalyst}} CH_3\text{-}CH_3 / C_2H_6$
Ethane 1

$C_2H_6/\ CH_3\text{-}CH_3 + \frac{7}{2} O_2 \longrightarrow 2CO_2 + 3H_2O$

Note: Correct equation even without balancing be given full credit 1 5

Q20. Placenta- A special tissue that helps human embryo in obtaining nutrition from mother's blood 1
Structure- this is a disc which is embedded in the uterine wall which 1,1

contains villi on the embryo side of the tissue, and on the mother's side are blood spaces which surround the villi

Function- This provides a large surface area for glucose and oxygen to pass from the mother to the embryo, and the developing embryo will also generate waste substances which can be removed by transferring them into the mothers blood through the placenta 1, 1 5

Q21. Evolution- The gradual unfolding of organisms from pre-existing organisms through change since the origin of life 1

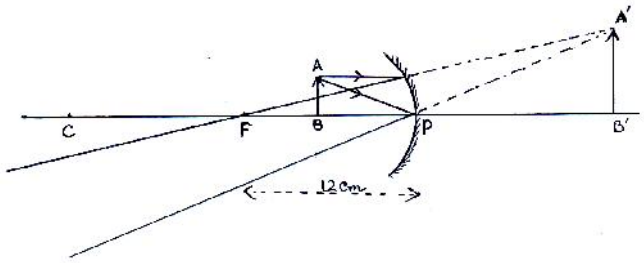
It occurs because there is an inbuilt tendency to variation during reproduction due to errors in DNA copying and as a result of sexual reproduction. 1,1

It is observed that although fossils appeared different from the existing species they may show certain features similar to the existing species thus providing linkages between pre-existing and existing forms 1

Provide information about the extinct species which were different from the existing species. 1 5

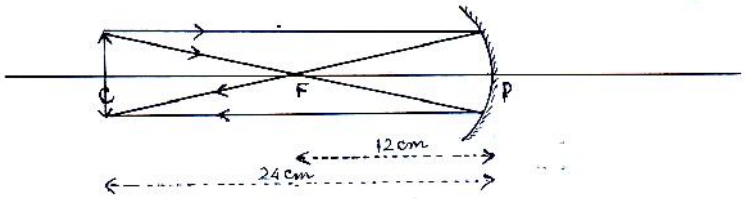
Q22. (i) Range of distance – between 0 cm - < 12 cm 1

ii) larger than the object ½



1 ½

iii) Image also at 24 cm in front of the mirror ½



1 ½ 5

Q23. a) Optical centre- the central point of a lens. 1

b) f= -20 cm ½

h_1 = 4 cm v = -10 u = ? h_2 = ?

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$ ½

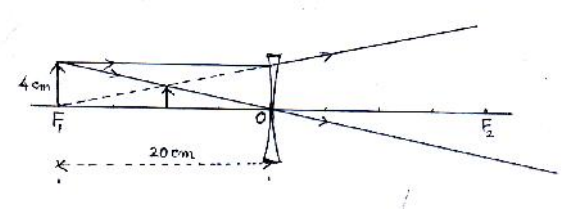
$$= \frac{-1}{-10} - \frac{1}{-20} = \frac{-1}{10} + \frac{1}{20}$$

$$= \frac{-2+1}{20} = \frac{-1}{20}$$

u = -20 cm 1

$$h_i = \frac{v}{u} h_o$$ ½

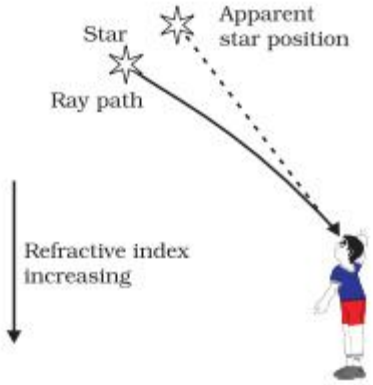
$$= \frac{-10\,\text{cm}}{-20\,\text{cm}} \times 4 = 2\,\text{cm}$$ ½



1 5

Q24 Atmospheric refraction- refraction of light caused by the earth's atmosphere due to change in the refractive indices of different layers 1

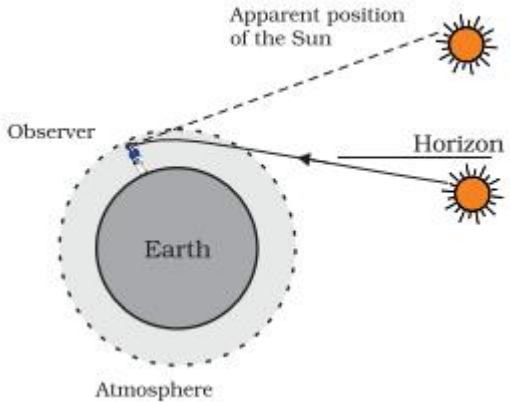
Twinkling of stars- stars are distant point sized source of light. The path of the rays of light coming from the star goes on varying due to atmospheric refraction slightly. Thus apparent position of the stars fluctuates and the amount of star light entering the eye flickers giving the twinkling effect 1



1

Advanced sunrise – when the sun is slightly below the horizon, light rays coming from the sun travel from the rarer to denser layers of air. Because of atmospheric refraction of light, light appears to come from a higher position above the horizon. Thus sun appears earlier than actual sunrise.

Delayed sunset- Same reason as similar refraction occurs at the sunset. 1



1 5

SECTION – B

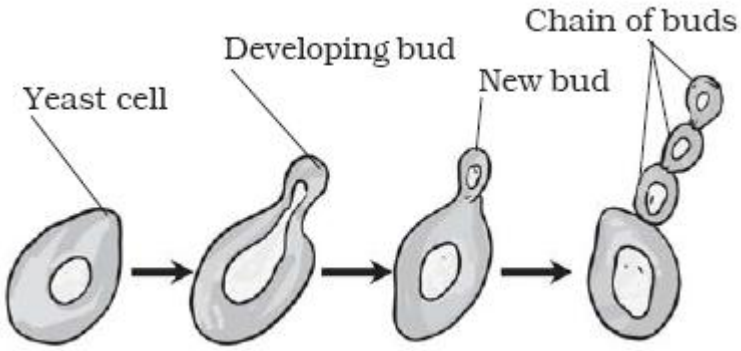
25 (c)	26 (c)	27 (d)		
28 (d)	29 (a)	30 (b)		
31 (a)	32 (a)	33 (d)	1 x 9	9

Q34. Brisk effervescence ½

Evolution of colourless /odourless gas ½

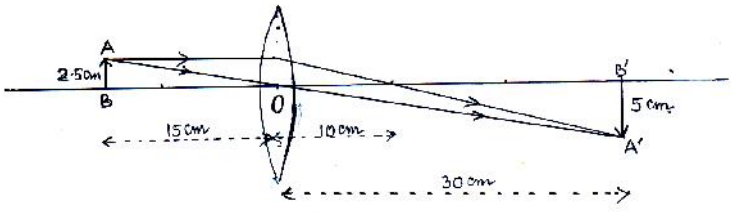
$CH_3COOH + NaHCO_3 \rightarrow CH_3COOONa + H_2O + CO_2$ 1 2

Q35. • Budding ½



(Three/ four diagrams in proper sequence) 1 ½ 2

Q36. 1



Marking of O , F and size of the image 1 2

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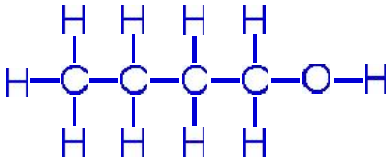
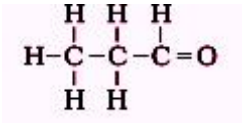
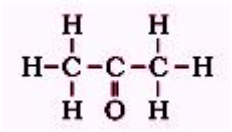
MARKING SCHEME **Code No. 31/2**
CLASS X – OUTSIDE DELHI

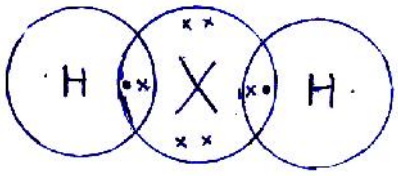
	Expected Answer/ Value point	Marks	Total
	SECTION – A		
Q1.	Butanol ; CH_3-CH_2-CH_2-CH_2OH Or 	½ , ½	1
Q2.	Bisexual ; Example- Hydra/Earthworm/Mustard/Hibiscus (Or any other relevant example)	½ , ½	1
Q3.	Use of excessive non biodegradable material in packaging Excessive use of natural resources like coal and petroleum which causes pollution Affluent lifestyle results in generation of excessive waste materials (any one)	1	1
Q4.	1)Inverted image; 2) magnified; 3) concave mirror ; 4) real image	4 x ½	2
Q5.	The measure of biodiversity of an area is the number of species found there. Since, in a forest we can find a range of different life forms of plants and animals the forests are the biodiversity hot spots.	1,1	2
Q6.	• Water harvesting is a technique of capturing rain water when it falls and taking measure to keep the water clean • Water is stored underground that remains unpolluted, it recharges wells and provides moisture for vegetation over a wide area.	1 1	2
Q7	• X − C_2H_5OH ; Y − H_2 gas • $2C_2H_5OH + 2Na \longrightarrow 2C_2H_5ONa + H_2\uparrow$ • Ethene; C_2H_4.	½ , ½ 1 ½ , ½	3
Q8.	• Propanal (aldehyde) ; 	½, ½	

- Propanone(ketone); ½, ½



- Isomers(same molecular formula but different structural formula/different functional group) 1 3

Q9.
- Electronic Configuration of X – 2,8.6
  Valence electrons – 6
  Valency - 8-6= 2 ½, ½
- Formula with hydrogen- H_2X or H_2S



½ , ½

Sulphur ; NonMetal ½, ½ 3

Q10.
- X (7) – 2,5 Group 15; Period 2 ½
- Y(8) – 2,6 Group 16; Period 2 ½
- Z(9) – 2,7 Group 17; Period 2 ½
- X> Y>Z ½
- XZ_3 1 3

Q11. Regeneration- It is the ability of an organism to give rise to a new organism/ individual from their body parts 1

. Regeneration in hydra-
- When the body of hydra by any means is cut into number of pieces ½
- Each piece contains specialized cells ½
- These cells proliferate and make large number of cells ½
- From this mass of cells different cells undergo changes to become various cell types and tissues finally developing into a new organism ½ 3

Q12 Fission-It is the method of asexual reproduction in unicellular forms of life
In this process the parent organism splits to form two or more daughter cells
Example- Ameoba /Plasmodium /Paramecium
(or any other relevant example) 1, ½

. Fragmentation- It Is the process found in multicellular organisms

The filament breaks up into two or more pieces upon maturation. These pieces then grow into new individuals
Example- Spirogyra 1, ½ 3

Q13. a) i) Involvement of two different individuals
ii) Creation of new combination of variants ½, ½
b) i) pollen/pollen grain
ii) by pollination/ agents of pollination
iii) It (pollen tube) helps male gamete to reach egg (ovule)
iv) Converts into embryo 4 x ½ 3

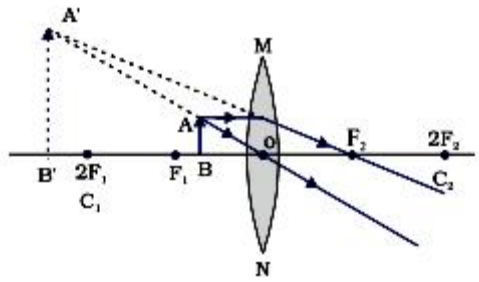
Q14.
- Different forms of organisms/ life have evolved during the course of evolution, and classification deals with grouping of these organisms into groups and subgroups based on their similarities and differences. ½ , ½
- The more characteristics any two species have in common more closely they are related/ will have a more recent ancestor(and vice versa) 1
- Thus classification helps tracing the evolutionary relationships between the two organisms hence classification and evolution are interlinked. 1 3

Q15. In one of the Mendel's experiments when (pure) tall pea plants were crossed with (pure) dwarf pea plants, only tall pea plants were obtained in the F1 generation. 1
On selfing the F1 generation pea plants, both tall and dwarf pea plants were obtained in the F2 generation. 1
Reappearance of dwarf characters in F2 generation proves that the dwarf trait was inherited but not expressed in F1 generation.
OR
Same explanation given with the help of a flow chart 1 3

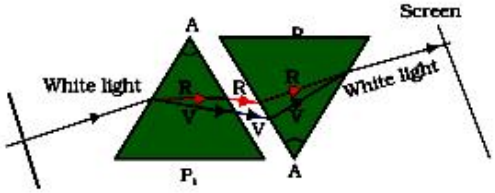
Q16. Image with magnification -1 means image is inverted and of the same size.
Therefore, object is at 2F and the image is also at 2F on the other side of the lens.
Therefore, distance between the object and its image is 4f = 60 cm 1

$\Longrightarrow$ f = 15 cm ½

Object distance 2f = 30 cm. if the object is shifted towards the lens by 20 cm, the new object distance = 30 cm – 20 cm = 10 cm. ½
This distance is less than the focal length , and the image formed in this case would be virtual, erect and will form on the same side as the object
1 3



Q17. Description of activity- When a glass prism is used to obtain a spectrum of sunlight, a second identical prism in an inverted position with respect to the first position will allow all the colours of spectrum to recombine .Thus a beam of white light will emerge from the other side of the second prism. 1 ½



1 ½ 3

Q18 Two reasons for the conservation of the environment

(a) 1) To save air, water and soil from pollution
2) To maintain ecological balance in nature 2 x ½

(b) Green dustbins- for biodegradable waste, and blue dustbins for non biodegradable waste for proper disposal of waste without wasting time and energy in segregating the biodegradable and non - biodegradable wastes 2 x ½

(c) Values – cooperative spirit, concern about environment, civic sense
Or any other (Any two) 2 x ½ 3

Q19. a) Distance between optical centre and focus of the lens. 1

b) $f = -30$ cm; $u = ?$; $h_1 = 5$ cm; $h_2 = ?$; $v = -15$ cm

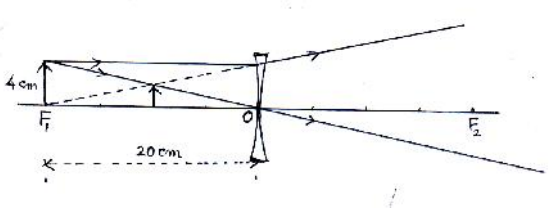
$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Longrightarrow \frac{1}{u} = \frac{1}{v} - \frac{1}{f} \Longrightarrow u = \frac{vf}{f - v}$$ ½

$$\Longrightarrow u = \frac{-15 \text{ cm} \times -30 \text{ cm}}{-30 \text{ cm} - (-15 \text{ cm})} = -30 \text{ cm}$$ 1 ½

$$m = \frac{v}{u} = \frac{h_2}{h_1} \Rightarrow h_2 = \frac{v}{u} \times h_1$$

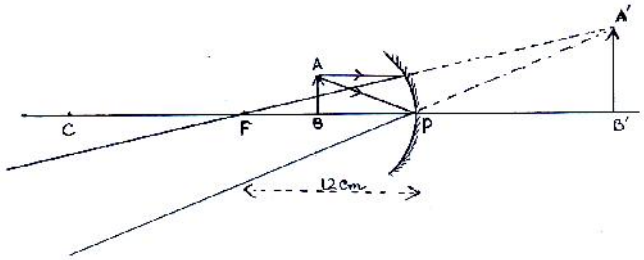
$$= -\frac{15 \text{ cm}}{-30 \text{ cm}} \times 5 \text{ cm} = 2.5 \text{ cm}$$ 1

1 5



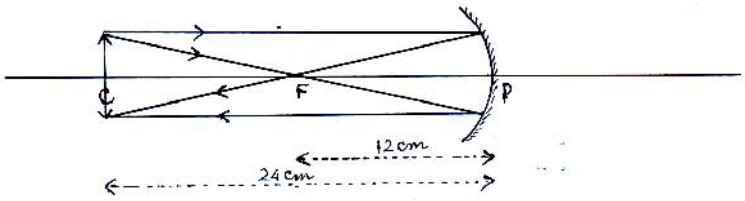
Q20. (i) Range of distance – between 0 cm - < 12 cm 1

ii) larger than the object ½



1 ½

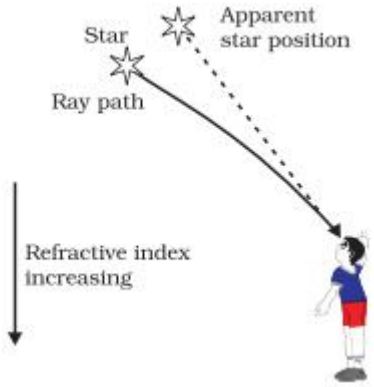
iii) Image also at 24 cm in front of the mirror ½



1 ½ 5

Q21 Atmospheric refraction- refraction of light caused by the earth's atmosphere due to change in the refractive indices of different layers 1

Twinkling of stars- stars are distant point sized source of light. The path of the rays of light coming from the star goes on varying due to atmospheric refraction slightly. Thus apparent position of the stars fluctuates and the amount of star light entering the eye flickers giving the twinkling effect 1



1

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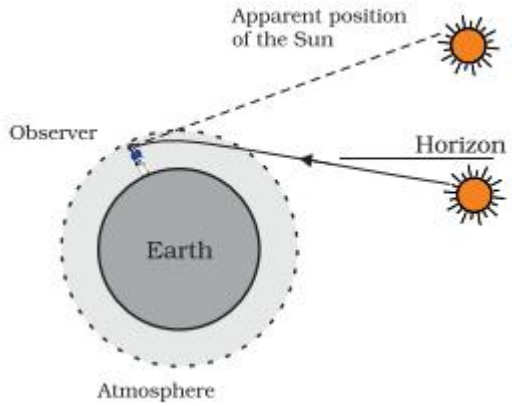
Delayed sunset- Same reason as similar refraction occurs at the sunset. 1



1 5

Q22. Placenta- A special tissue that helps human embryo in obtaining nutrition from mother's blood 1

Structure- this is a disc which is embedded in the uterine wall which contains villi on the embryo side of the tissue, and on the mother's side are blood spaces which surround the villi 1,1

Function- This provides a large surface area for glucose and oxygen to pass from the mother to the embryo, and the developing embryo will also generate waste substances which can be removed by transferring them into the mothers blood through the placenta 1, 1 5

Q23. Evolution − The gradual unfolding of organisms from pre-existing organisms through change since the origin of life 1

It occurs because there is an inbuilt tendency to variation during reproduction due to errors in DNA copying and as a result of sexual reproduction. 1,1

It is observed that although fossils appeared different from the existing species they may show certain features similar to the existing species thus providing linkages between pre-existing and existing forms 1

Provide information about the extinct species which were different from the existing species. 1 5

Q24. P= Ethanol/C_2H_5OH Q= Ethene/$CH_2=CH_2$ R=Ethane/ C_2H_6 3x ½

$C_2H_5OH \xrightarrow[443k]{\text{Conc } H_2SO_4} CH_2=CH_2 + H_2O$

Ethane Ethene 1 ½

$CH_2=CH_2 \xrightarrow[H_2]{\text{Nickel Catalyst}} CH_3\text{-}CH_3 / C_2H_6$

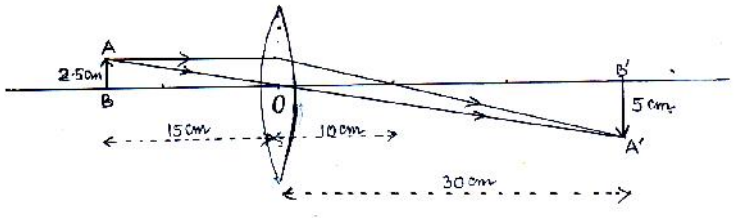
Ethane 1

$C_2H_6/\ CH_3\text{-}CH_3 + \frac{7}{2} O_2 \longrightarrow 2CO_2 + 3H_2O$

Note: Correct equation even without balancing be given full credit 1 5

SECTION – B

25 (d)	26 (a)	27 (b)		
28 (a)	29 (d)	30 (c)		
31 (c)	32 (a)	33 (d)	1 x 9	9

Q34. 

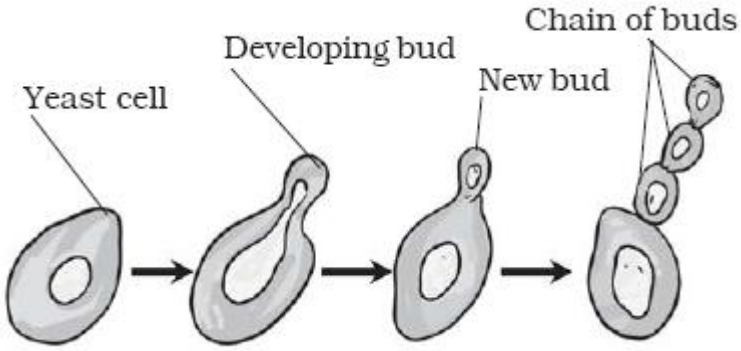
Marking of O , F and size of the image — 1 — 2

Q35. Brisk effervescence — ½

Evolution of colourless /odourless gas — ½

$CH_3COOH + NaHCO_3 \rightarrow CH_3COOONa + H_2O + CO_2$ — 1 — 2

Q36. • Budding — ½



(Three/ four diagrams in proper sequence) — 1 ½ — 2

Strictly Confidential- (For Internal and Restricted Use Only) **Secondary School Examination**
SUMMATIVE ASSESSMENT - II
March 2016

Marking Scheme – Science (Outside Delhi) 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.

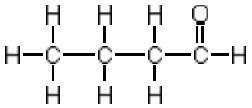
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

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.

MARKING SCHEME **Code No. 31/3**
CLASS X – OUTSIDE DELHI

	Expected Answer/ Value point	Marks	Total

SECTION – A

Q1. Butanal ; CH_3-CH_2-CH_2-CHO Or  ½ , ½ 1

Q2.
- To produce female gamete / ovum
- To secrete female hormones / estrogen / progesterone

2 x ½ 1

Q3. Grass → insect → frog ⟶ snake / 3rd trophic level 1 1

Q4. $\text{Refractive index of a medium} = \frac{\text{Speed of light in air}}{\text{Speed of light in the medium}}$

$\frac{3}{2} = \frac{\text{Speed of light in air}}{2\times10^8 \text{ m/s}}$

Speed of light in air = 3 x 10^8 m/s 1

$\text{Speed of light in water} = \frac{3\times10^8 \text{ m/s}}{4/3} = 2.25\times10^8 \text{ m/s}$ 1 2

Q5.
- Local people living in villages near the forest
- Industrialists who use forest produce as raw materials
- Wild life and nature enthusiasts
- Forest department of the government

4 x ½ 2

Q6. Social problems –
- Many people are rendered homeless
- Displacement of large number of tribals without due compensation
- Migration into the cities for settlements (Any two) 2 x ½

Environmental problems –
- Deforestation / loss of biodiversity
- Soil erosion / ecological imbalance

2 x ½ 2

Q7.
(i) Ca – 2,8,8,2 ½
(ii) Valence electrons in Rb - 1 ½
(iii) Five ½
(iv) Metal ½
(v) Rb is biggest in size ½
(vi) Be < Mg < Ca < Rb ½ 3

Q8. $CH_3COOH + Na_2CO_3 \longrightarrow 2CH_3COONa + H_2O + CO_2$

Sodium Carbonate — water carbondioxide

$CH_3COOH + NaHCO_3 \longrightarrow CH_3COONa + H_2O + CO_2$

Sodium hydrogen carbonate — water carbondioxide

$CH_3COOH + NaOH \longrightarrow CH_3COONa + H_2O$

Sodium hydroxide — water

$2CH_3COOH + 2Na \longrightarrow CH_3COONa + H_2$

Sodium — hydrogen gas

(Any three reaction)

Note- correct equation allot half mark each, mention of either product or reactants half mark each — 3x1 — 3

Q9.
a) Group 13 means valence electrons 3 and valency 3 — ½ , ½
b) Y(8) – 2,6 X=2,8,3
Valency- 2 Valency- 3
Compound formed- X_2Y_3/Al_2O_3 — 1
c) X Chlorine Cl
Valency- 3 Valency- 1
Compound formed- $XCl_3/AlCl_3$ — 1 — 3

Q10. Atomic number of X = Mass number of X – No of neutrons — ½
= 35 – 18 = 17 — ½
Therefore Electronic configuration of X = 2,8.7 — ½
Group number =17 — ½
Period no = 3
Valency = 8-7 = 1 — ½ , ½ — 3

Q11. a) i) Involvement of two different individuals
ii) Creation of new combination of variants — ½, ½
b) i) pollen/pollen grain
ii) by pollination/ agents of pollination
iii) It (pollen tube) helps male gamete to reach egg (ovule)
iv) Converts into embryo — 4 x ½ — 3

Q12. Reproduction – It is a (biological) process by which new individuals of the same species are produced by the existing organisms — 1

- Populations of organisms live in well defined places called niches in the ecosystem using their ability to reproduce. — ½
- Reproduction involves DNA copying which is the source of information for making proteins thereby controlling body design — ½
- These body designs allow the organism to use a particular niche for the stability of the population of a species — ½
- (Minor) variations may also lead to the stability of the species — ½ — 3

Q13. Regeneration- It is the ability of an organism to give rise to a new organism/ individual from their body parts 1

. Regeneration in hydra-

- When the body of hydra by any means is cut into number of pieces ½
- Each piece contains specialized cells ½
- These cells proliferate and make large number of cells ½

From this mass of cells different cells undergo changes to become various cell types and tissues finally developing into a new organism ½ 3

Q14.

- Different forms of organisms/ life have evolved during the course of evolution, and classification deals with grouping of these organisms into groups and subgroups based on their similarities and differences. ½ , ½
- The more characteristics any two species have in common more closely they are related/ will have a more recent ancestor(and vice versa) 1
- Thus classification helps tracing the evolutionary relationships between the two organisms hence classification and evolution are interlinked. 1 3

Q15.

- When a cross was made between a tall pea plant with round seeds and a short pea plant with wrinkled seeds, the F1 progeny plants are all tall with round seeds: this indicates that tallness and round seeds are the dominant traits. 1
- When the F1 plants are self pollinated the F2 progeny consisted of some tall plants with round seeds and some short plants with wrinkled seeds which are the parental traits 1
- There were also some new combinations like tall plants with wrinkled seeds and short plants with round seeds ½
- Thus it may be concluded that tall and short traits and round and wrinkled seed traits have been inherited independently ½ 3

OR

A flow chart depicting the same

Note: Any other contrasting characters can also be taken

Q16 Two reasons for the conservation of the environment

(a) 1) To save air, water and soil from pollution
2) To maintain ecological balance in nature 2 x ½

(b) Green dustbins- for biodegradable waste, and blue dustbins for non biodegradable waste for proper disposal of waste without wasting time and energy in segregating the biodegradable and non - biodegradable wastes 2 x ½

(c) Values – cooperative spirit, concern about environment, civic sense
Or any other

(Any two) 2 x ½ 3

Q17. $m = -2 \qquad \frac{v}{u} = 2 \qquad v = -30 \text{ cm}$

$u = -15$ 1

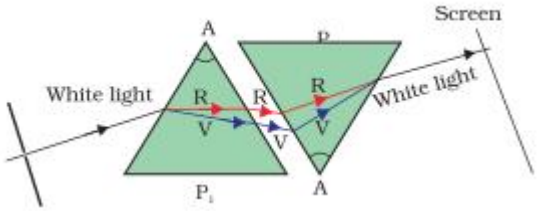
$$f = \frac{uv}{u+v} = \frac{-15\,\text{cm} \times -30\,\text{cm}}{-15\,\text{cm} + (-30)\,\text{cm}} = \frac{450}{-45} = -10\ \text{cm}$$ 1

If the object is shifted 10 cm towards the mirror $u = -5$ cm

Therefore the object is between pole and focus and the image formed is

i)Virtual ii) Erect iii) magnified (any two) ½ , ½ 3

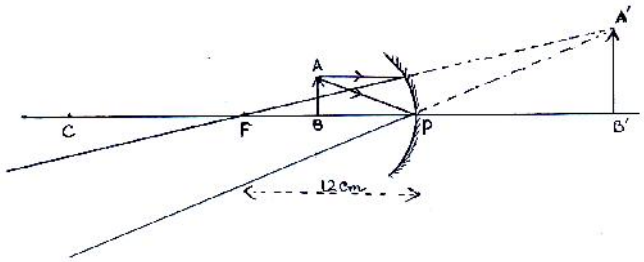
Q18. Description of activity- When a glass prism is used to obtain a spectrum of sunlight, a second identical prism in an inverted position with respect to the first position will allow all the colours of spectrum to recombine .Thus a beam of white light will emerge from the other side of the second prism. 1 ½



1 ½ 3

Q19. (i) Range of distance – between 0 cm - < 12 cm 1

ii) larger than the object ½



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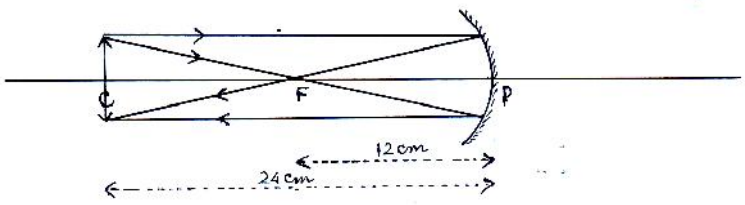

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Ethane — 1

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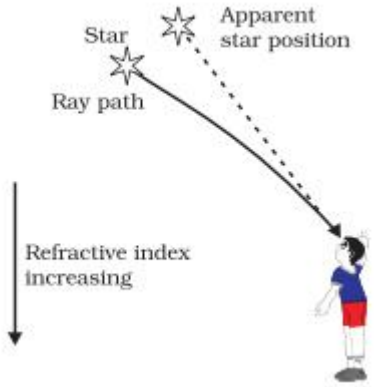

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Advanced sunrise – when the sun is slightly below the horizon, light rays coming from the sun travel from the rarer to denser layers of air. Because of atmospheric refraction of light, light appears to come from a higher position above the horizon. Thus sun appears earlier than actual sunrise.

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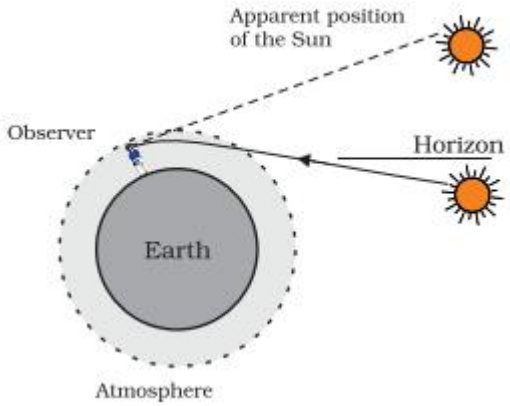


1 5

Q24. a) Focal length- distance between pole and principal focus of a divergent lens

b) $f = -30$ cm $u = ?$ $v = -15$ cm $h_1 = 6$ cm $h_2 = ?$ 1

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \quad \Rightarrow \quad \frac{1}{u} = \frac{-1}{f} + \frac{1}{v}$$

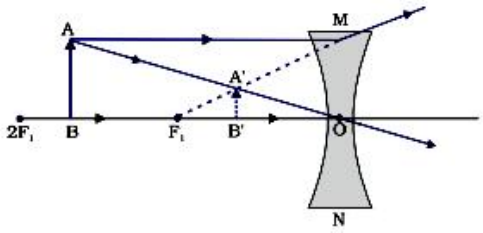
½

$$u = \frac{vf}{f - v} = \frac{-15\,\text{cm} \times -30\,\text{cm}}{-30\,\text{cm} - (-15)\,\text{cm}} = \frac{450}{-15} = -30\ \text{cm}$$

1 ½

$h_2 = \frac{v}{u} \times h_1 = \frac{-15\ \text{cm}}{-30\ \text{cm}} \times 6\ \text{cm} = 3\ \text{cm}$

1



1 5

SECTION – B

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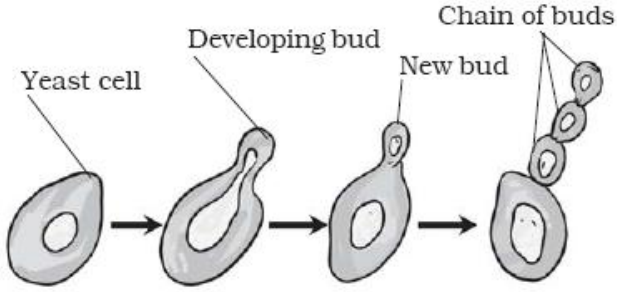
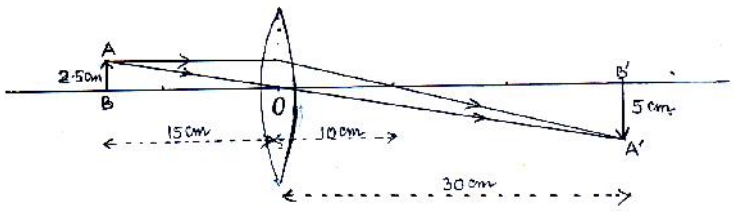
Q34. • Budding ½



(Three/ four diagrams in proper sequence) 1 ½ 2

Q35. 1



Marking of O , F and size of the image 1 2

Q36. Brisk effervescence ½

Evolution of colourless /odourless gas ½

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