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

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

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

2. Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed.

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

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

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

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

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

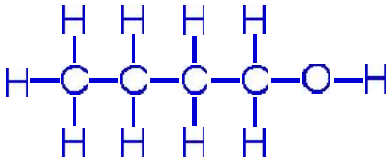
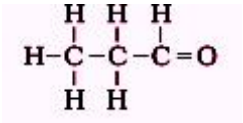
8. All the Head Examiners / Examiners are instructed that while evaluating the answer scripts, if the answer is found to be totally incorrect, the (X) should be marked on the incorrect answer and awarded '0' marks.

9. 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.

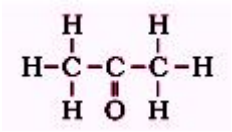
10. A full scale of mark 0 to 100 has to be used. Please do not hesitate to award full marks if the answer deserves it.

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**
**CLASS X – OUTSIDE DELHI**

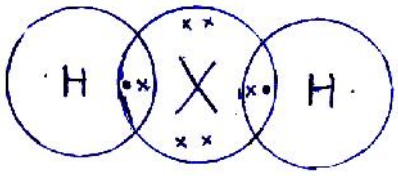
| | Expected Answer/ Value point | Marks | Total |
|---|---|---|---|
| | **SECTION – A** | | |
| Q1. | Butanol ; $CH_3$-$CH_2$-$CH_2$-$CH_2OH$<br>Or<br> | ½ , ½ | 1 |
| Q2. | Bisexual ; Example- Hydra/Earthworm/Mustard/Hibiscus<br>(Or any other relevant example) | ½ , ½ | 1 |
| Q3. | Use of excessive non biodegradable material in packaging<br>Excessive use of natural resources like coal and petroleum which causes pollution<br>Affluent lifestyle results in generation of excessive waste materials<br>(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<br>• Water is stored underground that remains unpolluted, it recharges wells and provides moisture for vegetation over a wide area. | 1<br>1 | 2 |
| Q7 | • X − $C_2H_5OH$ ; Y − $H_2$ gas<br>• $2C_2H_5OH + 2Na \longrightarrow 2C_2H_5ONa + H_2\uparrow$<br>• Ethene; $C_2H_4$. | ½ , ½<br>1<br>½ , ½ | 3 |
| Q8. | • Propanal ( aldehyde) ;<br> | 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

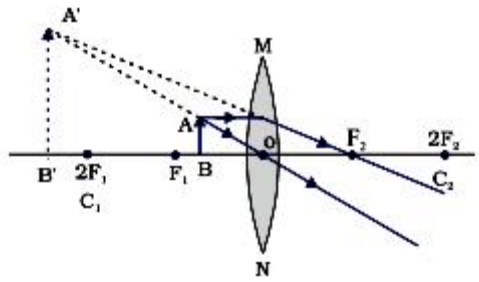
Q14.
- Different forms of organisms/ life have evolved during the course of evolution, and classification deals with grouping of these organisms into groups and subgroups based on their similarities and differences. ½ , ½
- The more characteristics any two species have in common more closely they are 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

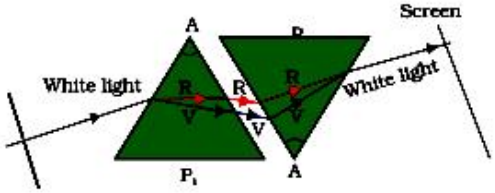
Q16. Image with magnification -1 means image is inverted and of the same size.
Therefore, object is at 2F and the image is also at 2F on the other side of the lens.
Therefore, distance between the object and its image is 4f = 60 cm 1

$\Longrightarrow$ $f$ = 15 cm ½

Object distance 2$f$ = 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

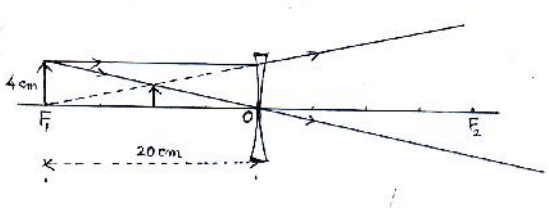
$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Longrightarrow \frac{1}{u} = \frac{1}{v} - \frac{1}{f} \Longrightarrow u = \frac{vf}{f - v}$$ ½

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

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

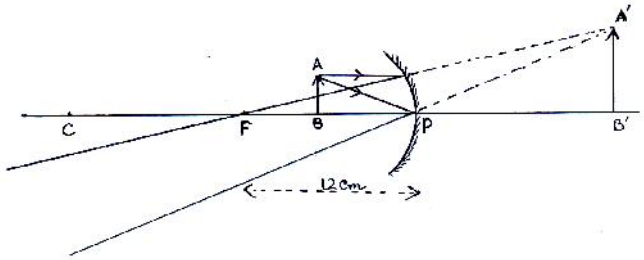
$$= -\frac{15 \text{ cm}}{-30 \text{ cm}} \times 5 \text{ cm} = 2.5 \text{ cm}$$ 1

1 5



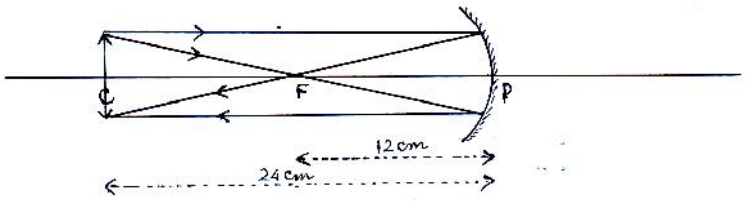

Q20. (i) Range of distance – between 0 cm - < 12 cm 1

ii) larger than the object ½




1 ½

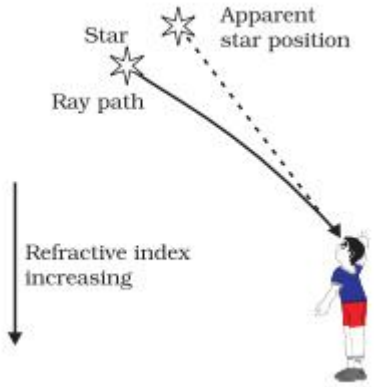
iii) Image also at 24 cm in front of the mirror ½




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

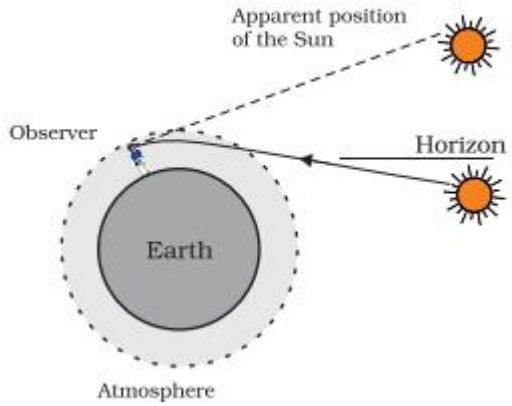
Twinkling of stars- stars are distant point sized source of light. The path of the rays of light coming from the star goes on varying due to atmospheric refraction slightly. Thus apparent position of the stars fluctuates and the amount of star light entering the eye flickers giving the twinkling effect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




1

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

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

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

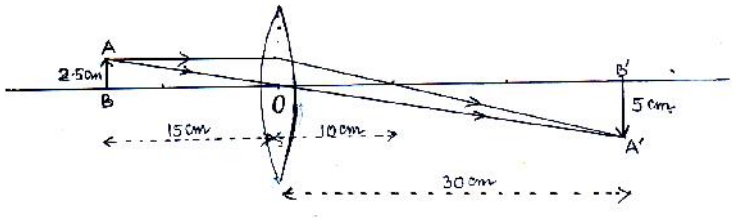
Ethane 1

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

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. 

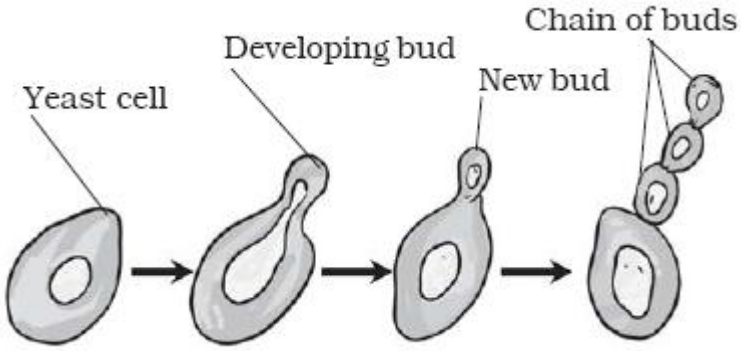

Marking of O , F and size of the image — 1 — 2

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