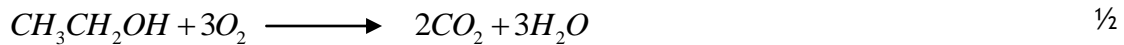


**Marking Scheme 2016**  
**Science**  
**Class - X (SA - II)**

- |   |   |                             |
|---|---|-----------------------------|
| 1 | Hydrogenation   | 1                           |
| 2 | Required for nourishing the embryo if fertilization takes place and reaches the uterus.   | 1                           |
| 3 | Red   | 1                           |
| 4 | Forests   | 1                           |
|   | Loss of ecological stability  | 1                           |
| 5 | Its ethanol, its molecular formula is $C_2H_6O$ and structural formula is $C_2H_5OH$ ( $CH_3CH_2OH$ )   | $\frac{1}{2} + \frac{1}{2}$ |
|   | $\underset{\text{Ethanol}}{CH_3CH_2OH} \xrightarrow[\text{heat}]{\text{Conc. } H_2SO_4} \underset{\text{Ethane}}{CH_2 = CH_2} + H_2O$   | 1                           |
| 6 | $\frac{\text{Real depth}}{\text{Apparent depth}} = \mu \quad \therefore \text{App depth} = \frac{6}{1.5} = 4\text{cm}$  | 2                           |
| 7 | Isomers are those compounds which have same molecular formula and different structural formula.<br>In first three members of alkane, branching is not possible, therefore isomers are not possible.   | 1                           |
|   | $CH_3\text{---}CH_2\text{---}CH_2\text{---}CH_2\text{---}CH_3$  | 1                           |
|   | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>Pentane</p> </div> <div style="text-align: center;"> <math>CH_3\text{---}CH\text{---}CH_2\text{---}CH_3</math><br/> <math>\quad\quad\quad  </math><br/> <math>\quad\quad\quad CH_3</math> </div> </div> | 1                           |
|   | 2-methyl butane   |                             |
| 8 | i)  |                             |
|   | a. Third member of aldehyde series- Propanal ( $CH_3CHO$ )  | 1                           |
|   | b. Second member of Carboxylic series- Ethanoic acid ( $CH_3COOH$ )   | 1                           |
|   | ii)   |                             |
|   | a. 2,2-dimethyl propane   | $\frac{1}{2}$               |
|   | b. 2 Butanol  | $\frac{1}{2}$               |
| 9 | i) Valence electrons in 'D' - 5<br>Valency of 'D' - 3   | 1                           |
|   | ii) 'A' will have largest atomic radii.   | 1                           |
|   | iii) 'A' will form the most basic oxide as it is most metallic.   | 1                           |

- 10 Complete burning of ethanol in the presence of excess of oxygen to give carbon dioxide and water is called combustion. 1



Addition of oxygen to ethanol in the presence of oxidizing agents to give ethanoic acid is called oxidation. 1



- 11 Future shoot - Plumule 1  
 Future root - Radicle 1  
 Cotyledon - Store food for the future plant or embryo 1  
 12 A disc shaped organ or special tissue in the uterus of pregnant mammal, nourishing and maintaining the foetus through the umbilical cord. 1

OR

Any other definition

Functions of placenta: (Any two)

- a) Provides large surface area for glucose and oxygen to pass from mother to the embryo. 1  
 b) Removal of waste generated in the developing embryo into the mothers blood or any other 1  
 13 Environmental Cue -  
 • In some animals, the temperature at which fertilized eggs are kept determines whether the developing animal in egg is male or female 1½  
 • In some animals like snail, individual can change sex.

Genetical Cue -

A child who inherits an x chromosome from her father will be a girl and one who inherits a y chromosome from the father will be a boy. 1½

- 14  $m = \frac{-v}{u} = \frac{h_e}{h_o}$   $h_e = -3cm$   $h_o = 2cm$   $u = -32cm$  3

$$m = \frac{h_e}{h_o} = \frac{-3cm}{2cm} = -1.5 \text{ or } = \frac{-v}{u} = -1.5$$

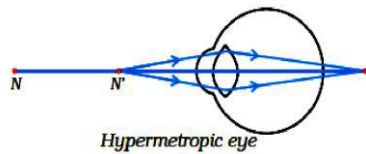
$$\therefore v = -48cm$$

$$\text{also } \frac{1}{f} = \frac{1}{v} + \frac{1}{u} = \frac{1}{-48} + \frac{1}{-32} = -\frac{5}{96}$$

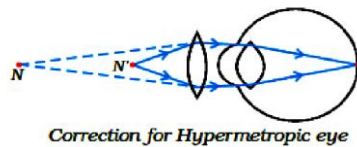
$$\therefore f = -19.2cm$$

$\therefore$  focal length of concave mirror is 19.2cm and image is formed 48 cm in front of it

- 15 (i) Hypermetropia 1/2  
 (ii) This defect arises because either  
 (a) focal length of eye lens is too large or 1/2  
 (b) the eyeball becomes too short.  
 (iii)



(iv)



- 16 The water droplets act like small prisms. They refract and disperse the incident sunlight, then reflect it internally and finally refract it again when it comes out of rain drop. Due to dispersion and internal reflection of light, different colours reach the observer's eye along different pairs. 3  
 Therefore the three phenomena involved are refraction, dispersion, internal reflection of light.

- 17 Rich & Powerful people are benefited - 1  
 We need to use resources carefully because -  
 • they are not unlimited  
 • the demand is increasing  
 due to human population rate increase because of improved health care - 2  
 • for sustainable development  
 • any other (Any two)

- 18 A.  
 (i) Unidirectional 1/2  
 (ii) Helps in understanding the food relationship and interaction among various organisms in an ecosystem 1/2  
 (iii) Helps to understand movement of toxic substances and the problem of their biological magnification 1/2  
 B.  
 (i) Sensitive towards environment  
 (ii) Possess knowledge about biological magnification 1 1/2  
 (iii) Scientific temperament  
 (iv) Conscious  
 (Any three)

- 19 a) Noble gas- G 1  
Halogen - F  
b) Most active metal - B 1  
c) Most electronegative in 3<sup>rd</sup> period- F 1  
d) Ionic bond 1  
e) Oxide formed by C would be basic. 1

20 A.

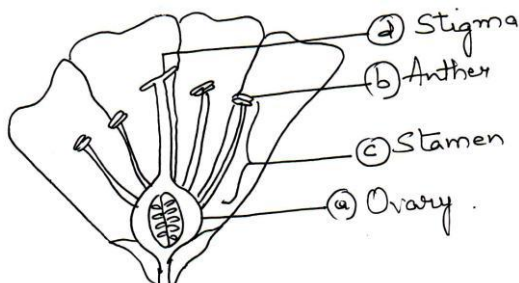


Diagram:1  
Labellings: 1/2x4

- B. A - Pollen grain  
B - Pollen tube  
C - Ovary  
D - Female gamete

1/2x4

- 21 A. Speciation may take place by 1  
(i) Migration  
(ii) Natural selection  
(iii) Mutation  
(iv) Genetic Drift  
(Any two)

- B. Segment of DNA which is functional and are made of nucleic acids and protein 1  
(Any other definition)

- C. Given  
Red hair - Mother - Recessive ∴ bb 1/2  
Black hair - father Dominant ∴ BB 1/2

Parents	Father		Mother
	BB/Bb	X	Bb/bb
F1	Bb (Black)		

1

1

Thus, the child will have black hair

22 A.

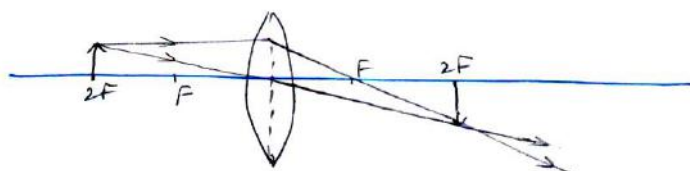
	Acquired Traits	Inherited Traits
1	Trait acquired during its lifetime	Traits inherited from its predecessors
2	Not inheritable	Inheritable
3	Not present in the genetic make up	Present in the genetic makeup
4	Change in DNA will not result in any change in such traits	Change in DNA will bring about change in such traits

2

(Any two difference)

- B. The mouse continue to have information for presence of tail in its DNA 1
  - So, will continue to have tail, because it is an acquired trait 1
  - C. Nature selects the best trail in a species, leading to survival of fittest and evolution of species 1
- (Any other difference)

- 23 (i) No, magnified image of an object cannot be formed by a concave lens ever. 2
- (ii) At  $2f$ .  $\frac{1}{2}$



(iii)

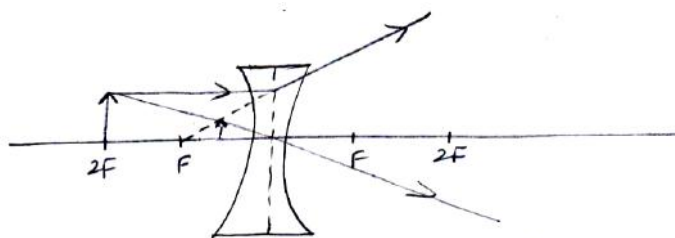
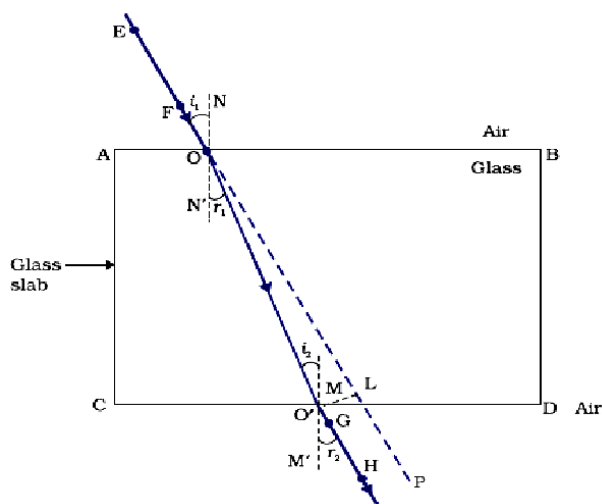
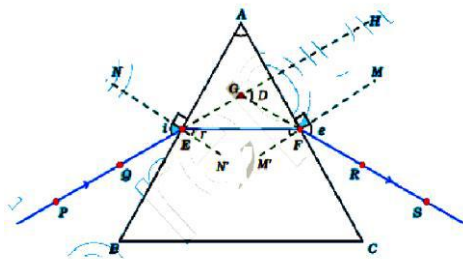


Image obtained is virtual, erect and diminished in case of concave lens  $\frac{1}{2}$

- 24 (i) When an object is placed between the pole and focus of concave mirror a magnified, erect and virtual image is obtained. 1
- (ii) For glass slab refer: 1



For prism refer:



In case of a rectangular glass slab, emergent rays of light are always parallel to the direction of incident rays. Whereas when an incident light passes through a prism, it bends towards the base of the prism hence incident ray and emergent ray are not parallel to each other.

$$(iii) \quad f = -50\text{cm} \quad p = \frac{100}{f} D = \frac{100}{-50} = -2D$$

- 25 c) Only C 1
- 26 b) Esters of long chain of fatty acids 1
- 27 a) Foaming capacity increases 1
- 28 d) parallel beam of light, after reflection meet at focus 1
- 29 a) 1
- 30 c) when the object is placed between F and P, virtual image is obtained 1
- 31 a) Micropyle 1
- 32 c) 10% sugar solution 1
- 33 d) III 1
- 34 Turnip, Carrot, Sweet Potato - are modified root - Homologous organs  
Potato - modified stem. 1 ½
- 35 B, for better result, the angle of incidence should be in the range 30°-60° and larger separation between pins will give better collinearity of pin and accuracy of result. 2
- 36 He should move the lens towards the screen. As the distance of object increased, the image formed by a convex lens will be more close to the focus. 2