

Marking Scheme 2016-17
Science
Class - X (SA - II)

- | | | |
|---|--|-------------|
| 1 | Hydrogenation | 1 |
| 2 | Moustaches, Beard, Hoarse voice, Thick growth of hair on the body (Any two) | 1 |
| 3 | To prevent u-v radiation from reaching the earth. | 1 |
| 4 | f= -10cm (since the image is formed at the focus)
Now u= - 20cm, i.e. the candle flame is at C
∴ The image would form at C and would be of the same size
Ray diagram (Refer Fig. 10.7(c) Page 166 NCERT Text-book) | ½
½
1 |
| 5 | Conclusion: Water is polluted by sewage
Coliform is a group of bacteria found in human intestine whose presence in river water indicates contamination by disease causing micro-organisms. | 1
1 |
| 6 | <ul style="list-style-type: none"> • Forests • Range of different life forms plays an important role in maintaining ecological balance as they all depend on each other for their survival. | ½
1½ |
| 7 | <ul style="list-style-type: none"> • Isomers: Compounds which have same molecular formula and different structural formula. • In first three members of alkane series, branching is not possible, therefore isomers are not possible. • Two isomers of butane C₄H₁₀ | 1
1 |
| | | ½+½ |
| 8 | <ul style="list-style-type: none"> • X- Ethanol C₂H₅OH • Y- Ethanoic acid CH₃COOH • Z- Ester CH₃COOC₂H₅ | ½
½
½ |
| | <p>• $\text{CH}_3\text{CH}_2\text{OH}$ (X) $\xrightarrow[\text{or Acidified } \text{K}_2\text{Cr}_2\text{O}_7 + \text{Heat}]{\text{Alkaline } \text{KMnO}_4 + \text{Heat}}$ CH_3COOH (Y)</p> <p>• CH_3COOH (Y) + $\text{CH}_3\text{CH}_2\text{OH}$ (X) $\xrightarrow{\text{Acid}}$ $\text{CH}_3\text{COOC}_2\text{H}_5$ (Z)</p> | 1
½ |
| 9 | • Atomic number of A - 17 | ½ |

	• Electronic configuration of A = (2, 8,7)	1/2
	• A is a non-metal.	1/2
	• B →2,8,1	
	B will give one electron to A to form an ionic compound- Ionic bond	1 1/2
	• Formula of the compound B ⁺ A ⁻	
10	(a) K, Electronic configuration of K is 2,8,8,1	1
	(b) Be and Ca Be (4) = 2,2	
	Ca (20) = 2,8,8,2	1
	• K ⁺ X ⁻ K = 2,8,8,1	
	X = 2,8,7	
	K will give one electron to X to form ionic bond. So the compound formed K ⁺ X ⁻ will be an ionic compound.	1
11	• This process is called regeneration.	1/2
	• Diagram (Refer Fig 8.3 Page 131 NCERT Text-book)	1
	• When a Planaria is cut into three pieces, each of its pieces grow into separate individual; specialized cells proliferate; mass of cells get differentiated into various cells and tissues.	1
	• Another example of an organism showing the characteristics is Hydra	1/2
12	• Four methods of contraception	
	(i) Mechanical/ Barrier method	4 x 1/2
	(ii) Use of hormonal preparations	
	(iii) Use of loop/Copper-T/ IUCD	
	(iv) Surgical method (Tubectomy/ Vasectomy)	
	• Effect on health and prosperity (Any two)	
	• Health of women is maintained	
	• Better attention of children by the parents	2 x 1/2
	• More resources for better living standard	
13	Two functions each of	
	• Ovaries: (i) Production of female sex hormone.	
	(ii) Production of female gamete.	2 x 1/2
	• Fallopian tube (i) Transfer of female gamete from ovary	
	(ii) Site of fertilization.	2 x 1/2
	• Uterus (i) Implantation of zygote	
	(ii) Nourishment of developing embryo.	2 x 1/2
14	Environmental Cue -	
	• In some animals, the temperature at which fertilized eggs are kept determines whether the developing animal in egg is male or female	1 1/2
	• 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.	1 1/2

15

	Acquired Traits	Inherited Traits	
•	Does not bring about change in the DNA of germ cells	Bring about change in the DNA of the germ cells	2 x 1 1
•	Cannot be passed on to the progeny	Can be passed on to the progeny	
•	Cannot direct evolution	Can direct evolution (Any two)	
•	Examples: Acquiring knowledge/ less of body parts.	Skin colour/ color of the eyes	

16 • Converging lens (Convex lens)

 $\frac{1}{2}$

• Here $u + v = 6m$
 $v = 3u$
 $\therefore u + 3u = 6m$
 $\Rightarrow u = 1.5m$

1

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

 $\frac{1}{2}$

$$\therefore f = \frac{(-1.5m)(4.5m)}{-1.5m - (4.5m)} = +1.125m$$

1

17 a) Hypermetropia

 $\frac{1}{2}$

b) Two causes: (i) The focal length of the eye lens is too long
(ii) The eye ball has become too small

2 x $\frac{1}{2}$

c) Ray diagram (Refer fig 11.3 (c) page 190 NCERT textbook)

 $\frac{1}{2}$

18 (a) Importance of green plants, reducing air pollution, reducing noise levels, aesthetic value, sapling distribution, giving potted plants in place of bouquet, creating awareness (any three)

1 $\frac{1}{2}$

(b) To protect and improve the natural environment, social awareness, environmental conservation, eco-friendly approach value for life (any three)

1 $\frac{1}{2}$

19 (a) Two reasons for large number of carbon compounds

(i) Catenation: Unique ability of carbon to form bonds with other atoms of carbon giving rise to long chains of different types of compounds

1

(ii) Tetravalency: Since carbon has a valency of 4, it is capable of bonding with four other atoms of carbon or atoms of the other elements such as Oxygen, Nitrogen, Hydrogen, Sulphur, chlorine etc.

1

(b)

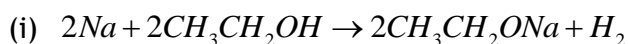
(i) Carbon has 4 elements as its outmost shell and needs to gain or lose 4 electrons to attain noble gas configuration. Losing or gaining 4 electrons is not possible for energy consideration, hence it shares electrons to form the covalent bands

1

(ii) The forces of attraction between the molecules are not very strong hence the carbon compounds generally have low melting and boiling points.

1

(c)



1/2



1/2

20 A.

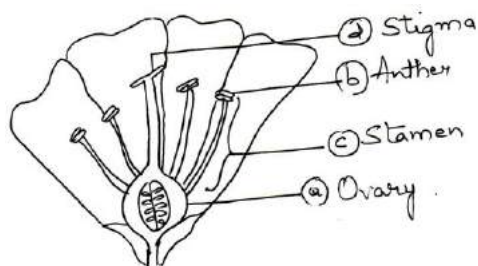


Diagram:1
Lebellings:4x1/2

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

4x1/2

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
 (Any other definition)

1

C. Given

Red hair - Mother - Recessive ∴ bb

1/2

Black hair - father Dominant ∴ BB

1/2

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

1

1

Thus, the child will have black hair

22

a) 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.

1

Therefore the three phenomena involved are refraction, dispersion, internal reflection of light.

1 1/2

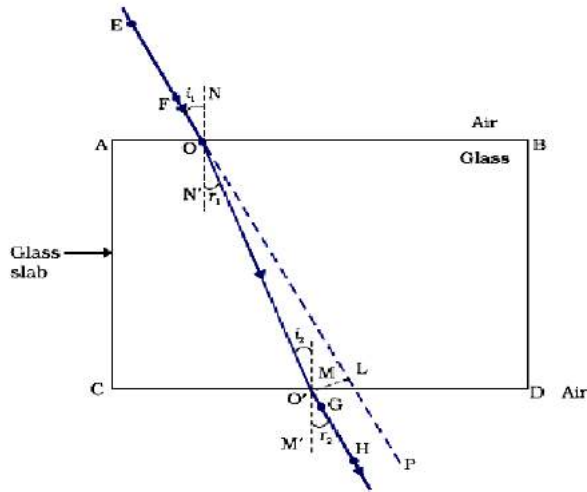
Red

1/2

b) At sunrise / sunset, sunlight has to travel a larger distance. So, it come across more number of particles which scatters most of blue colour and the light reaching our eyes has more of reddish light. This makes sun orange. At noon, the distance travelled by light is comparatively less that results in lesser scattering. Thus sun looks white.

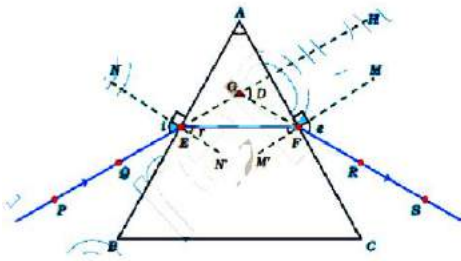
2

- 23 (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:

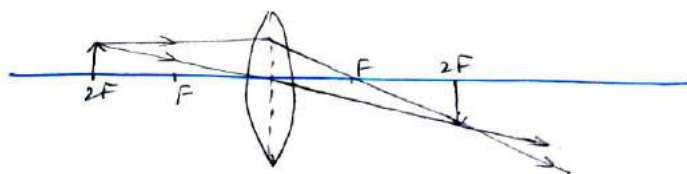


1

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. 1

(iii) $f = -50\text{cm}$ $p = \frac{100}{f} D = \frac{100}{-50} = -2D$ 1

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



1

(iii)

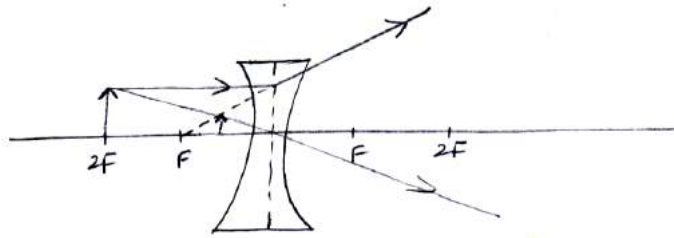


Image obtained is virtual, erect and diminished in case of concave lens

- | | | |
|----|--|--------|
| | | 1 |
| 25 | (a) | 1 |
| 26 | (a) | 1 |
| 27 | 2 | 1 |
| 28 | (d) | 1 |
| 29 | (c) | 1 |
| 30 | (d) | 1 |
| 31 | (b) | 1 |
| 32 | (b) | 1 |
| 33 | (d) 1 - plumule, 2- radicle | 1 |
| 34 | <ul style="list-style-type: none"> • Carbon dioxide/CO_2 • lime water turns milky when CO_2 gas is passed through it/ the gas liberated extinguishes a boring splinter | 1
1 |
| 35 | Turnip, Carrot, Sweet Potato - are modified root - Homologous organs
Potato - modified stem. | 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 |