

Model Question Paper Solution

Class-X

Science

Section – A

Marking

Q. 1	-	C	01
Q.2	-	C	01
Q.3	-	D	01
Q.4	-	B	01
Q.5	-	A	01
Q.6	-	C	01
Q.7	-	D	01
Q.8	-	D	01
Q.9	-	A	01
Q.10	-	B	01
Q.11	-	D	01
Q.12	-	B	01
Assertion/Reason			
Q.13	-	D	01
Q.14	-	D	01
Q.15	-	A	01

Section-B

Q.16

{Magnesium is a reactive metal. It combines with oxygen in air to form a layer of magnesium oxide on its surface.} {Hence, it should be cleaned with a sand paper before burning to remove the oxide layer formed on its surface.}

$$1+1=2$$

Q.17

{The process of adding water to an acid is highly exothermic,} {therefore it is always recommended that acid should be added to water.} {If it is done the other way, then it might be possible that because of the large amount of heat generated, the mixture may splash out and cause burns.}

$$0.5+0.5+1=2$$

Q.18.

{When ethyne is burnt in air, it gives a sooty flame. This is due to incomplete combustion caused by limited supply of air.} {However, if ethyne is burnt with oxygen, it gives a clean flame with temperature 3000°C because of complete combustion. This oxy-acetylene flame is used for welding.} { It is not possible to attain such a high temperature without mixing oxygen. This is the reason why a mixture of ethyne and air is not used.}

0.5+0.5+1
=2

Q.19

{Convex mirrors are commonly used as rear- view (wing) mirrors in vehicles because they give an erect, virtual, full size diminished image of distant objects with a wider field of view.} {Thus, convex mirrors enable the driver to view much larger area than would be possible with a plane mirror.}

1+1
=2

Q 20

Given That,

Refractive index $\mu = 1.50$

Speed of light $c = 3 \times 10^8 \text{ m/s}$

We Know that

$$n_g = c/v_g$$

$$v_g = \frac{3 \times 10^8}{1.50}$$

$$v_g = 2 \times 10^8 \text{ m/s}$$

Hence the speed of light in glass is $2 \times 10^8 \text{ m/s}$

1

+

1

=2

Q.21

{The eye is not able to decrease the focal length beyond a limit. When the eye is focused on a closer object, the ciliary muscles are strained and the focal length of the eye-lens decreases.} {Because of some reason, the eye is not able to decrease the focal length beyond a limit, hence a normal eye is not able to see objects closer than 25 cm.}

1+1
=2

Q.22

{Multicellular organisms such as humans possess complex body designs. They have specialised cells and tissues for performing various necessary functions of the body such as intake of food and oxygen.} {Unlike unicellular organisms, multicellular cells are not in direct contact with the outside environment. Therefore, diffusion cannot meet their oxygen requirements}.

1+1
=2

Q.23

{The movements of the leaves of the sensitive plant are touch-sensitive and independent of growth known as thigmonasty. While the movement of the shoot towards light is growth-} {related and known as phototropism. A plant's response to light is called phototropism. Phototropism occurs in plants when they respond to sunlight.}

1+1
=2

Q.24

{To filter out nitrogenous waste products like urea and uric acid from the blood in humans.}

{Organ for storage: Urinary Bladder}

{Organ for release: Urethra}

Q.25

{Tungsten has the highest melting point (3695K), lowest vapour pressure and greatest tensile strength among all the metals. It can reach higher temperatures before melting and hence can emit brighter light.} {Also, the light emitted due to heated tungsten lies in the visible spectrum and is yellow in colour which makes it the most preferred material for filament of electric bulbs.}

Q.26

The two properties of carbon which lead to huge number of compounds:-

(i) Catenation: Catenation means carbon atoms have the tendency to link with one another through covalent bonds to form chains and rings.

(ii) Tetravalency: The valency of Carbon atom is 4 ,so it capable of bonding with four other atoms of carbon or atoms of some other element.

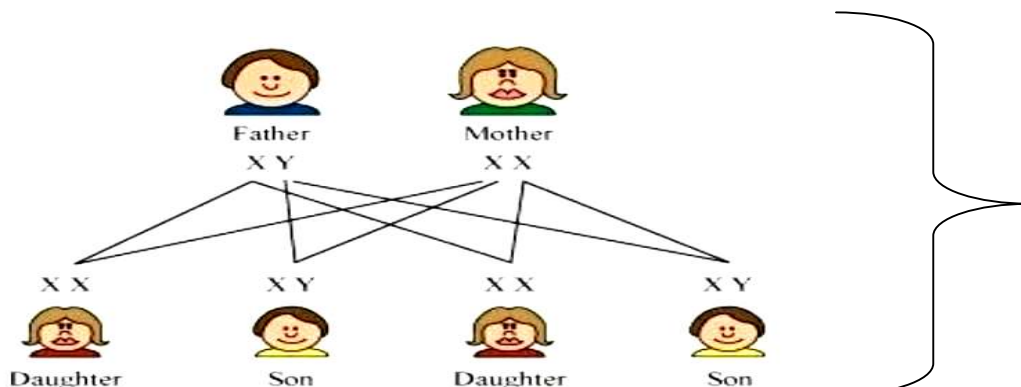
Q.27

{The sperm has either X or Y chromosome, while the egg has only X chromosome. So, if the sperm carrying Y chromosome fuses with the egg, it results in the formation of a male child; and if the sperm carrying X chromosome fuses with the egg, it results in the formation of a female child.}

{Thus, there is an equal chance of fusion of either X or Y chromosome with the egg.

Therefore, we can say that the sex of a newborn child is a matter of chance and none of the parents are responsible for it.}

Sex determination in humans is shown below:-



$$1+0.5+0.5=2$$

$$2+1=3$$

$$2+1=3$$

$$1+1+1=3$$

Q.28

{a) 10000J because only 10% of energy is available for the next trophic level.}

b) No, since the loss of energy at each step is so great that very little usable energy will remain after 4 trophic level.

$$1 + 2 = 3$$

Q.29

{Corrosion is the phenomenon of attacking the surface of a metal by air and moisture, so the metal gets corrodes.}

Necessary conditions for corrosion are:

1. Presence of oxygen and air.
2. Presence of water and moisture.
3. Metals placed higher in the activity series.

$$0.5 + 1.5 + 1 + 1 + 1 = 5$$

Methods for prevention of corrosion The rusting of iron can be prevented by greasing, painting, galvanizing, anodizing, or oiling the surface. These methods can be classified into the following categories:

1. Galvanization: Galvanized metal is coated with a thin layer of zinc to protect it against corrosion. The zinc oxidizes when it is exposed to air creating a protective coating on the metal surface.

2. Alloying: It is the method of improving the properties of a metal by mixing the metal with another metal or nonmetal. When iron is alloyed with chromium and nickel in stainless steel is obtained. Stainless steel does not rust at all.

3. Painting: Rusting of iron can be easily prevented by coating the surface with paint which protects iron from air and moisture.

Q.30

Given:

Image distance, $v = -10\text{cm}$ Focal length, $f = -15\text{cm}$ [f is -ve for a concave lens]

To find: We have to find the object distance, u

Solution:

Using lens formula, $1/v - 1/u = 1/f$ we have, $1/u = 1/v - 1/f$ $1/-10 = (-3 + 2)/30$

So, $u = -30\text{cm}$

Thus the object should be placed at a distance of 30cm from the lens on the left side.

We know, Magnification = $m = v/u = -10/-30 = 1/3$ $m = 0.33$ (Positive) Thus the image is virtual, erect and diminished.

Hence, The object distance = 30cm Magnification = $3 = 0.33$

Q.31

a) Sameer is suffering from diabetes.

The hormone responsible for diabetes is insulin.

The organ producing the hormone is pancreas.

b) The hormone present in the area of rapid cell division in a plant is cytokinin and the hormone which inhibits the growth is abscisic acid.

$$1 + 2 + 2 = 5$$

$$1 + 1 + 1 = 3$$

$$1 + 1 = 2$$