Paper: **Science X Summative Assessment Term II Sample Paper - 2**

Total marks of the paper: 90 Total time 3 hrs

1] What is meant by near point of a human eye? [Marks:1]

2] Draw the electron dot structure of CH3Cl. [Marks:1]

3] List any two common methods by which solid wastes of urban areas are disposed off. [Marks:1]

4] Mention any two functions of human ovary. [Marks:2]

5] Why transfer of energy between various organisms is not so efficient? [Marks:2]

6] Two elements 'A' (atomic number 7) and 'B' (atomic number 15) belong to group 15 of the periodic table. Write the electronic configuration of these elements. Which of these will be more electronegative and why? [Marks:2]

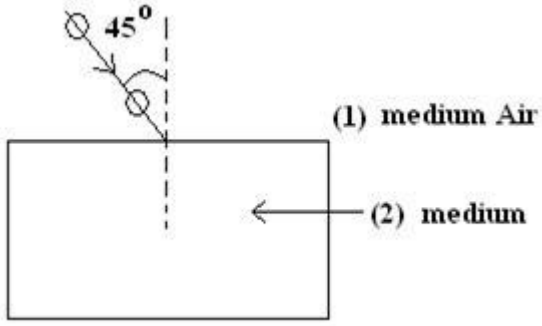
7] Why do we seek to build dams? [Marks:2]

8] To get an image of same size as that of the object by a thin convex lens of focal length 20 cm, where should the object be placed? Draw ray diagram to show image formation in this case. Is the image real or virtual? [Marks:3]

9] While sitting in the last row, a student has difficulty in reading the black board clearly. State the defect of vision the student is suffering from. Mention two causes of this defect. Suggest a suitable lens for the correction of this defect. [Marks:3]

10] An object is kept in front of a concave mirror of focal length 20 cm. The image is three times the size of the object. Calculate two possible distances of the object from the mirror. [Marks:3]

11] [Marks:3]



A ray of light is incident at an angle of 450 at the interface of medium (1) and medium (2) as shown in the above diagram. Redraw this diagram in the answer book and complete it. If the angle of refraction is 300 find the refractive index of medium (2) with respect to medium (1).(Given that sin 450 = 1/√2 and sin 300 = 1/2)

If second medium is water in place of medium (2), will the angle of refraction increase or decrease? Why? (refractive index of water =4/3)

12] (a) How and (b) Why do atomic radii of elements change as we move [Marks:3]
(i) From left to right in a period?
(ii) Down a group in the periodic table?

13] Chemical reactivity of alkali metals increases while that of halogens decreases as we move from top to bottom in a group. Give reasons. [Marks:3]

14] [Marks:3]

Group / Period	1	2	13	14	15	16	17	18
I	a							j
II	b	e				g	h	k
III	c			f			i	l
IV	d							

Consider the table given above and answer the following questions:
(i)Name the most reactive metal.
(ii) How many shells does 'd' have
(iii) Name the element (s) having valency 2.
(iv) How many valence electrons does 'j' have?
(v) Which is more non - metallic, 'h' or 'i'?
(vi) The atom of which element is bigger in size, 'e' or 'h'?

15] List any three advantages of water harvesting. [Marks:3]

16] What is the homology between fore limb of frog, lizard and wing of a bird? [Marks:3]
What does it indicate? State one function each of forelimbs of
(i) Human being, (ii) birds.

17] Define fossils. How are they formed? [Marks:3]

18] When a plant with purple flower was crossed with a plant having white flower, in F1generation all flowers appeared were purple. If F1 generation plants are self fertilized, what is expected in F2 progeny? Explain with the help of a flow chart. [Marks:3]

19] Differentiate between menarche and menopause. Mention any three points. [Marks:3]

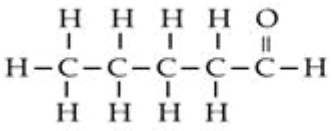
20] State the type of mirror required to get [Marks:5]
(i) virtual and diminished image of an object
(ii) real and diminished image of an object
Show image formation in both the above cases in the form of ray diagrams. Which of the above mirrors can also form (i) real and magnified (ii) virtual and magnified image of the object? Draw ray diagrams to justify your answer.

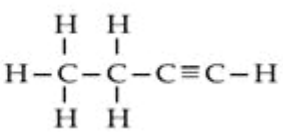
21] State the type of lens used to get [Marks:5]
(i) virtual and diminished image of an object
(ii) real and diminished image of an object
Justify your answers in the above two cases by drawing ray diagrams. Which of the above lens can also form (i) real and magnified and (ii) virtual and magnified image of an object? Draw ray diagram to justify your answer.

22] (a) What is meant by accommodation of eye? Name the part of eye which helps in this phenomenon and state how does it help. [Marks:5]
(b) A star appears on the horizon. What is the true position of the star? Explain with the help of a diagram.

23] (a) Why does it take some time to see objects in a cinema hall when we just enter the hall from bright sunlight? Explain in brief. [Marks:5]
(b) Name the following parts of a human eye -
(1) A thin membrane through which light enters the eye.
(2) Dark muscular diaphragm that controls the size of the pupil.
(c) Which defect of eye can be corrected using a cylindrical lens?
(d) Which type of cells responds to brightness of light?

24] (i) Write the name of the following compounds : [Marks:5]

(a) 

(b) 

(i) Write chemical equations for the following reactions:
(a) Ethene is made to react with hydrogen in the presence of Nickel Catalyst.
(b) Ethanol is heated with alkaline KMnO4
(c) Sodium carbonate is made to react with ethanoic acid.
Write chemical equations for the following reactions :

25] (i) Complete the following reactions [Marks:5]

(a) $C_2H_5OH + CH_3COOH \xrightarrow{\text{Conc. } H_2SO_4} \_\_\_\_ + H_2O$

(b) $CH_4 + Cl_2 \xrightarrow{\text{Sunlight}} \_\_\_\_ + HCl$

(c) $CH_3\,CH_2\,OH \xrightarrow[H_2SO_4]{\text{Hot Conc.}} \_\_\_\_ + H_2O$

(ii) State two properties of carbon which lead to huge number of carbon compounds we see around us.

26] Sketch a neat diagram of female reproductive system in human beings and label on it. [Marks:5]
(i) Fallopian tube (ii) ovary (iii) uterus (iv) cervix
(b) Mention a change seen in a girl at the time of puberty
(c) How do mechanical barrier devices prevent pregnancy?

27] Mention secondary sexual characteristics in human male and female. [Marks:5]

28] Define the term 'double fertilization in plants'. After fertilization name the part in each case which develops into (i) fruit and (ii) seeds. Where does vegetative propagation finds its application? [Marks:5]

29] What is regeneration of an organism? Describe with the help of a neat diagram about regeneration in ' Planaria'. [Marks:5]

30] Monika has to determine the focal length of a concave mirror and a convex lens of focal length about 15 cm each. She uses a distant tree as the object and obtains the sharp image of the tree, one by one on a screen. The distances l1 and l2 between the mirror/lens and the screen in the two cases and the nature of their respective images obtained on the screen are likely to be [Marks:1]

A. (30 cm, 15 cm) and (erect, inverted)
B. (15 cm, 30 cm) and (inverted, erect)
C. (30 cm, 30 cm) and (inverted, inverted)
D. (15 cm, 15 cm) and (inverted, inverted)

31] In an experiment, the image of a distant object formed by a concave mirror is obtained on a screen. To determine the focal length of the mirror, we should measure the distance between the [Marks:1]

A. mirror and the object
B. object and the screen
C. mirror and the screen and also between the object and the screen.
D. mirror and the screen

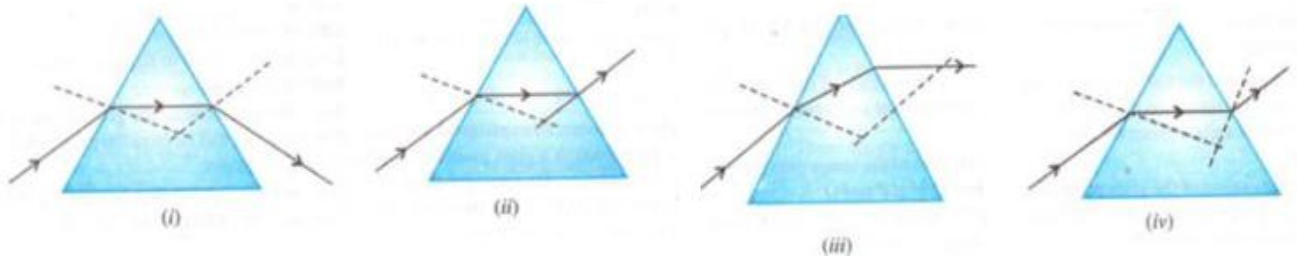
32] Given below are a few steps (not in proper sequence) followed in the determination of focal length of a given convex lens by obtaining a sharp image of a distant object [Marks:1]
(a) Measure the distance between the lens and screen.
(b) Adjust the position of the lens to form a sharp image.
(c) Select a suitable distant object.
(d) Hold the lens between the object and screen with its faces parallel to the screen.
The correct sequence of steps for determination of focal length is :

A. (C), (A), (D), (B)
B. (C), (A), (B), (D)
C. (A), (B), (B), (D)
D. (C), (D), (B), (A)

33] To dray the image of object formed by a convex lens for its various positions, a student covered the upper half of the lens by an opaque screen, he observes that [Marks:1]

A. full image but of increased intensity is seen
B. half image of same intensity is seen
C. full image and of same intensity is seen
D. complete image is formed but of decreased intensity

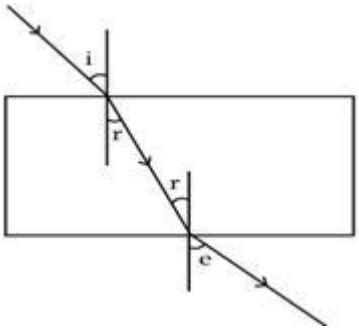
34] A student showed the following traces of the path of a ray of light passing through a glass prism



The trace most likely to be correctly drawn is

A. (ii) C. (iv)
B. (iii) D. (i)

35] While tracing the path of a ray of light passing through glass slab as shown in the diagrams, four students interpreted the results as given below. [Marks:1]



(A) $\angle r > \angle e = \angle i$ (B) $\angle r = \angle e < \angle i$ (C) $\angle i = \angle r < \angle e$ (D) $\angle i = \angle e > \angle r$

The student who has made the correct interpretation is

A. A C. C
B. B D. D

36] Acetic acid was added to a solid X kept in a test tube. A colorless and odorless gas Y was evolved. The gas was passed through lime water which turned milky. It was concluded that: [Marks:1]

A. Solid X is sodium hydroxide and the gas Y is CO2
B. Solid X is sodium acetate and the gas Y is CO2
C. Solid X is sodium hydrogen carbonate and the gas Y is SO2
D. Solid X is sodium carbonate and the gas Y is CO2

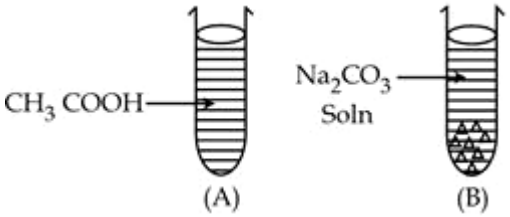
37] When we put acetic acid in H2O, the ions formed are: [Marks:1]
I. CH3COO- II. H3O+

A. I C. Neither I nor II
B. II D. I and II both

38] The soap solution should be stirred carefully so that: [Marks:1]

A. It does not get solidified
B. It does not melt
C. It does not explode
D. It does not spill out

39] A student put red litmus in two test tubes A and B as shown. [Marks:1]



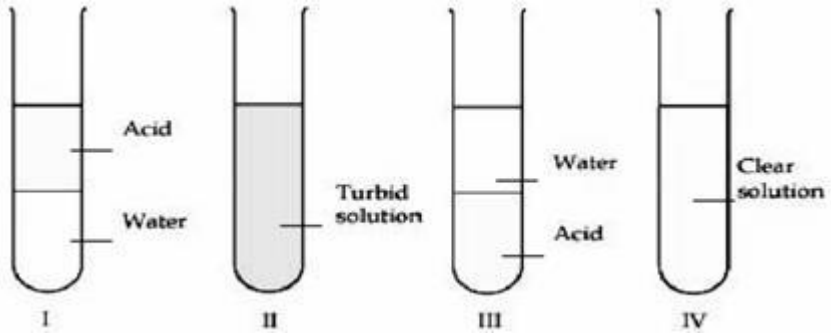
He would immediately observe that red litmus :

A. In 'A' turns blue, while in 'B' it remains red
B. In both A and B , it remains red
C. In both A and B, it changes to blue
D. In 'A' remains red, while in 'B' it becomes blue

40] Which of the following is called vinegar used in pickles? [Marks:1]

A. 100% acetic acid
B. 50% acetic acid
C. 10-20% acetic acid
D. 5-10% acetic acid

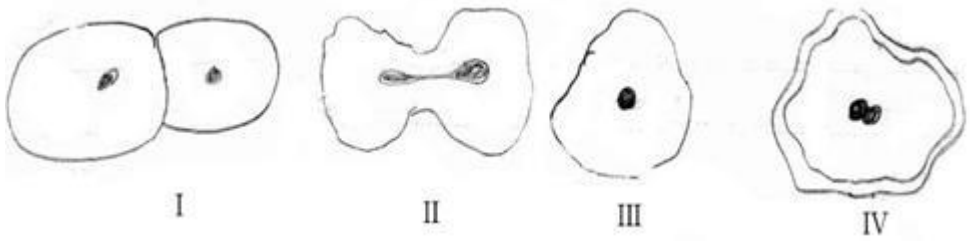
41] Student added 5 mL of acetic acid to 5 mL of water and the mixture was shaken well for one minute and allowed to settle. [Marks:1]



The correct representation of the observation made would be

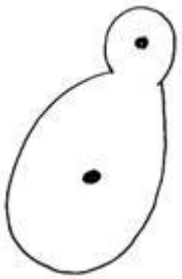
A. I
B. II
C. III
D. IV

42] The diagram which most appropriately illustrates the binary fission in amoeba is [Marks:1]



A. I
B. III
C. IV
D. II

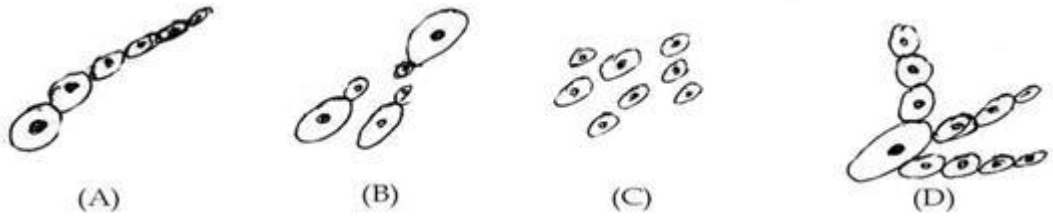
43] Following diagram was drawn by a student on having seen a prepared slide under a compound microscope. [Marks:1]



The slide depicts

A. Binary fission in yeast
B. Binary fission in Amoeba
C. Budding in Amoeba
D. Budding in yeast

44] The diagram which does not illustrate budding in yeast is [Marks:1]



A. A
B. B
C. D
D. C

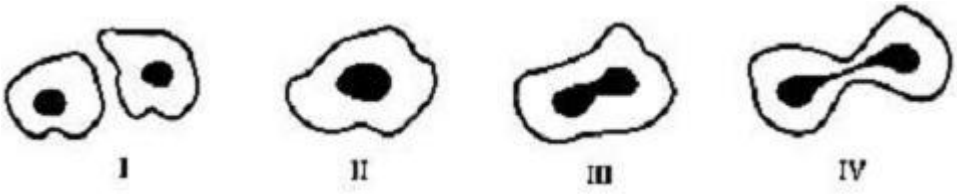
45] Student A, B and C were given five raisins each of equal weight. The raisins were soaked in distilled water at room temperature. A removed the raisins after 20 minutes: B after two hours and C after 40 minutes. If PA, PB, and PC denote percentage absorption of water obtained by student A, B and C respectively, then: [Marks:1]

A. PA > PB > PC
B. PA < PB < PC
C. PA = PB = PC
D. PA < PB > PC

46] A student dissolved 1 g of sugar in 10 mL of distilled water in a beaker A. He dissolved 10 g of sugar in 100 mL of distilled water in beaker B. Then he dropped a few raisins, in each. After two hours he found he found the raisins. [Marks:1]

A.	Swollen in A and shrunken in B	C.	Shrunken in both
B.	Swollen in A and swollen in B	D.	Swollen in both

47] In the following diagram binary fission in amoeba is illustrated but the different stages of the process are not in proper sequence. [Marks:1]

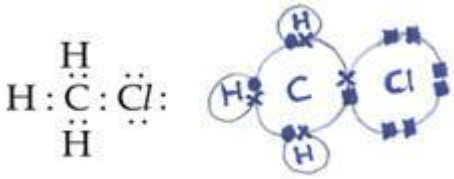


The correct sequence of fission process is

A. II, IV, III, I
B. III, II, IV, I
C. III, IV, II, I
D. II, III, IV, I

Solutions: **Science X Summative Assessment Term II Sample Paper - 2**

1] The nearest position of an object from a human eye so that its sharp image is formed on the retina. It is 25 cm for normal vision

2] 

3] Buried in landfills, composting, recycling, incineration. (Any two).

4] (i) It produces female gametes called ovum.
(ii) It secretes female sex hormones.

5] When one form of energy is changed to another, some energy is lost to the environment in forms such as heat which cannot be used again.

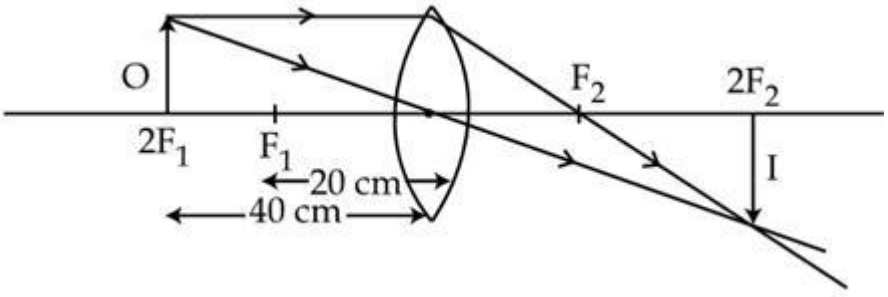
6] A = 7 ⇒ 2, 5

B = 15 ⇒ 2, 8, 5

A will be more electronegative in nature due to small size and high effective nuclear pull.

7] Large dams can ensure the storage of adequate water for irrigation and generating electricity.

8] Object should be placed at 2F (ie 40 cm) distance from the optical centre of the lens.



The image formed is real and inverted.

9] (i) Myopia or shortsightedness.
(ii) Two causes of this defect are:
1. increase in the length of the eyeball, as if distance of retina from the eye lens has increased.
2. decrease in focal length of the eye lens when the eye is fully relaxed.
(iii) Concave lens.

10] f = −20 cm

(i) For real image,

m = −3

$= -\frac{v}{u}$

or v = 3u

$\because \frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$\frac{1}{-20} = \frac{1}{3u} + \frac{1}{u} = \frac{4}{3u}$

or $u = -\frac{80}{3} = -26.67$ cm

(ii) For virtual image,

m = +3

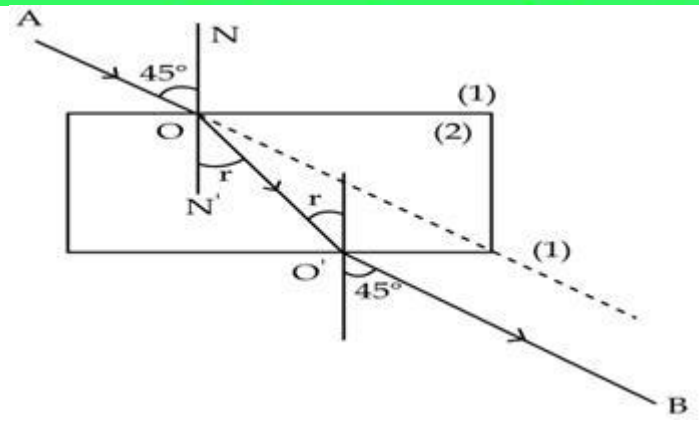
$= -\frac{v}{u}$

or v = −3u

$\because \frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$\frac{1}{-20} = \frac{1}{-3u} + \frac{1}{u} = \frac{2}{3u}$

or $u = -\frac{40}{3} = -13.33$ cm

11] 

Using snell's law

$$n_{21} = \frac{\sin i}{\sin r} = \frac{\sin 45^{\circ}}{\sin 30} = \frac{1/\sqrt{2}}{1/2} = \sqrt{2} = 1.414$$

If second medium is water, angle of refraction will decrease because water is rarer than medium (2).

12] (i) Atomic radius decreases in moving from left to right along a period.
Reason: It is due to increase in nuclear charge which tends to pull the electrons closer to the nucleus.
(ii) Atomic size increases down the group.
Reason: It is because new shells are being added. This increases the distance between outermost electrons and the nucleus

13] Alkali metals have one electron in their respective valence shells. They have a strong tendency to lose this electron and acquire the stable configuration of the nearest noble gas. Thus, the reactivity of alkali metals depends upon their ability to lose electrons. Since their tendency to lose electrons increases down the group hence their reactivity increases down the group.
In contrast, halogens have seven electrons in their respective valence shells and thus have strong tendency to acquire or gain one electron to achieve the stable electronic configuration of the nearest noble gas. Thus, reactivity of halogens depends upon their ability to attract electrons. Since this tendency to gain electrons decreases down the group due to increase in size hence reactivity decreases down the group.

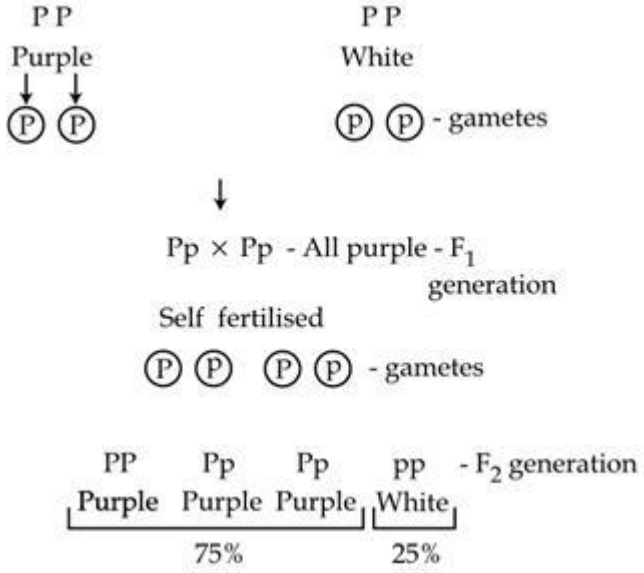
14] (i) Element 'b'
(ii) 4 shells
(iii) Elements 'e' and 'g' have valency 2.
(iv) Zero valence electrons
(v) Element 'h' is more non-metallic
(vi) Element 'e'

15] (i) It helps to recharge the ground water beneath.
(ii) The stored water does not evaporate, but spreads to recharge wells and provides moisture for vegetation over a wide area.
(iii) It does not provide breeding grounds for mosquitoes like stagnant water collected in ponds or artificial lakes.

16] All of these are similar in fundamental structure but perform different functions.
It indicates that more similarity in the fundamental structure, more close is the relationship among the species.
Function of forelimbs are:
(i) Fore limbs of human beings - Eating /writing
(ii) Forelimbs of birds - flying.

17] Fossils are the impressions or remains of ancient life found preserved in sedimentary rocks. When organisms die, their bodies get decomposed and lost. But every once in a while, the entire body or atleast some parts may be in an environment that does not let it decompose completely. If a dead insect gets caught in hot mud, it will not decompose quickly and the mud will eventually harden and retain the impression of the body parts of the insect. All such preserved traces of living organisms are called fossils.

18]

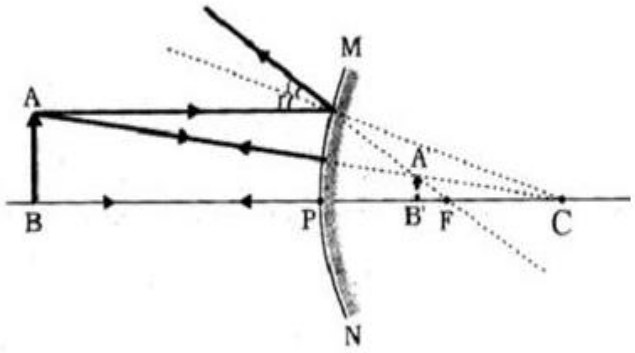


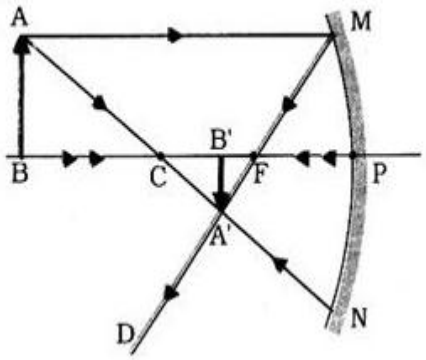
In F2 generation, 75% of the progeny will be Purple and 25% will be white.

19]

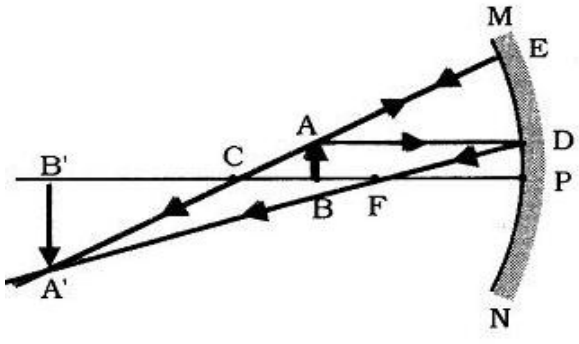
Menarche	Menopause
(i) It is the start of menstruation in human females.	(i) It is the stoppage of menstruation in human females.
(ii) It occurs at the age of 10-12 years.	(ii) It occurs at the age of 50 years.
(iii) It marks the beginning of reproductive life in a human female.	(iii) It is the end of reproductive life in a human female.

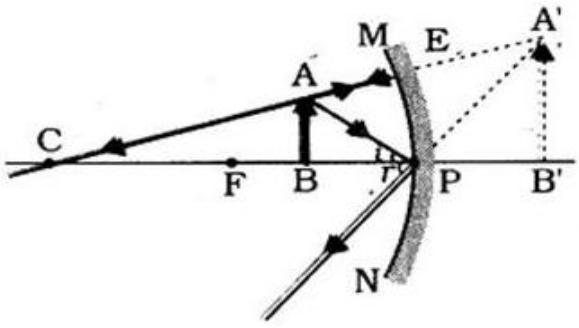
20] (i) Convex mirror (ii) Concave mirror



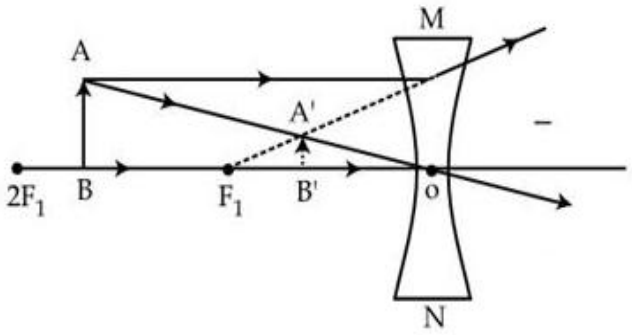


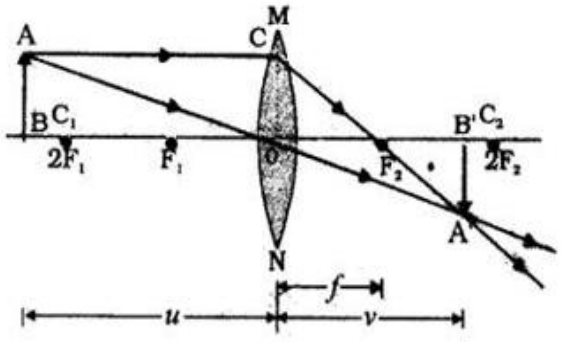
A concave mirror can form both real and magnified or virtual and magnified image.



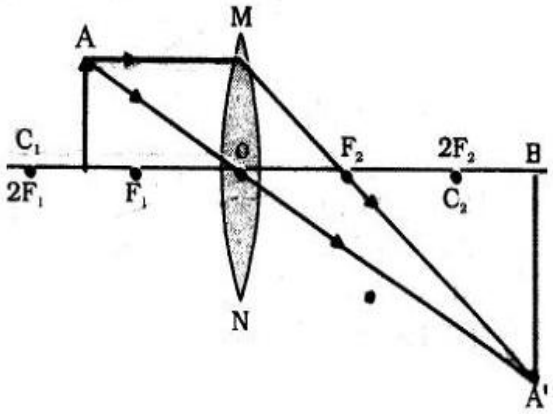


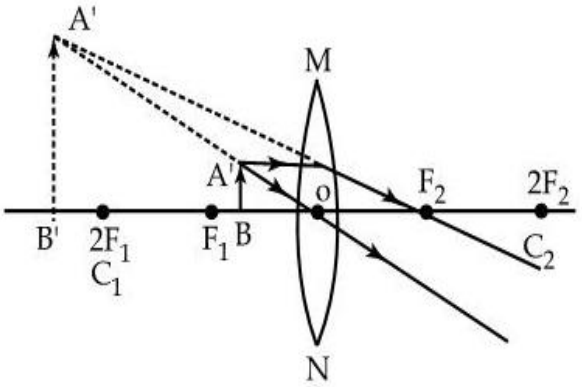
21] (i) Concave lens (ii) Convex lens



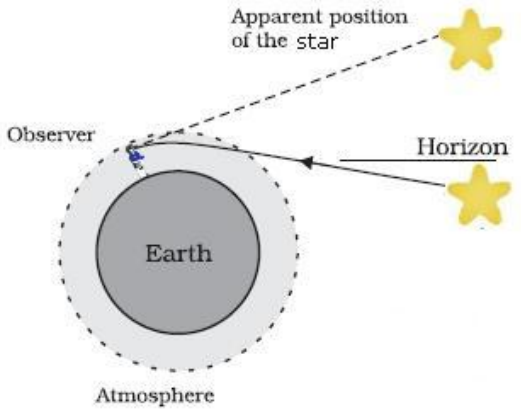


A convex lens can form both real and magnified or virtual and magnified image.





22] (a)
(i) The ability of eye lens to adjust its focal length
(ii) By ciliary muscles. While looking at distant objects muscles relax and focal length increases; while looking at nearby objects muscles contract and focal length decreases.

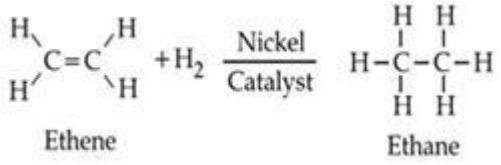


(b)
True position of the star is below the horizon. Incident rays from star, travel through earth's atmosphere and reach observer's eye. These incident rays travel from rarer atmosphere to denser atmosphere and bend towards normal. Thus appear to come from different position which is slightly upwards.

23] (a) The pupil regulates and controls the amount of light entering the eye. In bright sunlight the size of the pupil is small and when we enter the cinema hall it takes some time for the pupil to expand in size due to dim light.
(b) (1) Cornea (2) Iris
(c) Astigmatism
(d) Rod shaped cells respond to brightness/intensity of light.

24] (i) (a) Pentanal (b) Butyne

(ii) (a)



(b)

$$CH_3CH_2OH \xrightarrow[\text{or acidified } K_2Cr_2O_7 + \text{heat}]{\text{alkaline } KMnO_4 + \text{Heat}} CH_3COOH$$

(c)

$$Na_2CO_3 + 2CH_3COOH \rightarrow 2CH_3COONa + CO_2 + H_2O$$

25] (i) (a) $C_2H_5OH + CH_3COOH \xrightarrow{\text{conc.}H_2SO_4} CH_3COOC_2H_5 + H_2O$

(b) $CH_4 + Cl_2 \xrightarrow{\text{sunlight}} CH_3Cl + HCl$

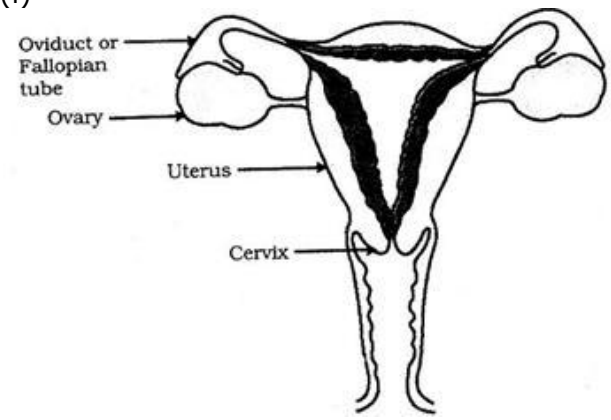
(c) $CH_3CH_2OH \xrightarrow[H_2SO_4]{\text{hot conc.}} H_2C = CH_2 + H_2O$

(ii) The properties of carbon that leads to huge number of carbon compounds are:

a. Tetravalency

b. Catenation

26] (i)



(ii) Breast size begins to increase.

(iii) Do not allow entry of sperms into the female genital tract at the time of copulation

27] In the life of human beings, reproductive system becomes functional at a definite age called puberty. Generally, male attain puberty at the age 13-14 years, while female attain it at the age of 11-12 years. Secondary sexual characters develop and the following visible changes can be noticed.

Secondary Sexual Characters in males:

(i) Appearance of facial hair (beard and moustache)

(ii) Pubic hair grows over the reproductive organs.

(iii) Pitch of the voice change

(iv) Increased development of musculature.

Secondary Sexual Characters in females:

(i) Development of mammary glands.

(ii) Pubic hair grows over the reproductive organs.

(iii) Menstrual cycle starts.

(iv) Increase in the subcutaneous fat particularly in thighs, buttocks and face.

28] Double fertilization occurs when one male nucleus fertilizes with egg cell to form a zygote cell and the other male nucleus fuses with two polar nuclei to cause triple fusion. As these two types of fertilizations takes place at the same time in the ovule of the plant, it is known as double fertilization.

After fertilization:

(i) Ovary develops into a fruit.

(ii) Ovules develop into seeds.

Vegetative propagation is used in methods such as layering or grafting to grow many plants like sugarcane, roses or grapes for agricultural purposes.

29] Regeneration is the ability of an organism to grow into a complete individual if its body is into any number of pieces. If can be seen in Hydra and Planaria.

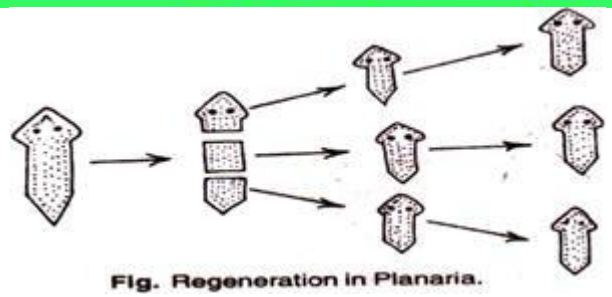


Fig. Regeneration in Planaria.

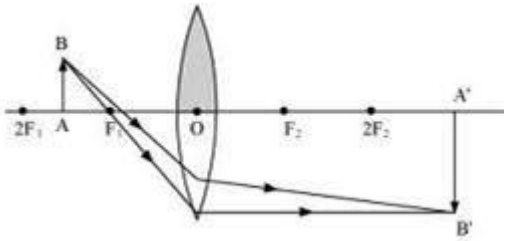
Regeneration is carried out by specialized cells which proliferate and make large number of cells. From this mass of cells, different cells undergo change to0 become various cell types and tissues. These changes take place in an organized sequence referred to as development.

30] In each case, the distances l1 and l2 give the focal length of the mirror and lens respectively. Also, the image formed in both cases is real and inverted.

31] Concave mirror focuses the image of distant object on the focus. So, the focal length can be measured by measuring distance between the mirror and screen.

32] To determine the focal length of a convex lens, the correct sequence of steps is as follows:
1. Select a suitable distant object.
2. Hold the lens between the object and screen with its faces parallel to the screen.
3. Adjust the position of the lens to form a sharp image.
4. Measure the distance between the lens and screen.

33] Complete image of the object is formed but the intensity of image will be reduced.



34] After first refraction the, refracted ray bends towards the normal. After second refraction, emergent ray bends away from the normal.

35] Since glass is denser than air, so

$\angle i > \angle r$

$\angle e > \angle r$

Also, $\angle i = \angle e$ (as emergent ray is parallel to the incident ray)

36] Carbon dioxide gas is evolved when acetic acid is reacted with sodium carbonate. Only CO2 can turn lime water milky, SO2 can't.

37] Acetic acid ionizes in water forming acetate and hydronium ions both.

38] Soap solution should be stirred so it does not get spill out.

39] Acetic acid being acidic does not change the colour of red litmus while Na2CO3 being basic in nature turns the red litmus blue.

40] 5-10% acetic acid solution is called vinegar and is used in pickles.

41] Acetic acid is completely miscible with water and forms a clear solution when dissolved in water.

42] Diagram II shows enlargement of nucleus and constriction in Amoeba.

43] As in the given diagram a yeast cell is shown with an outgrowth or bud on it.

44] Bud appears as protuberance.

45] Absorption of water increases with time up to its maximum limit.

46] Solution in both A and B are hypotonic to raisins and hence they swell.

47] II is Amoeba, III shows enlargement of nucleus, IV shows constriction and IV shows two daughter Amoeba.