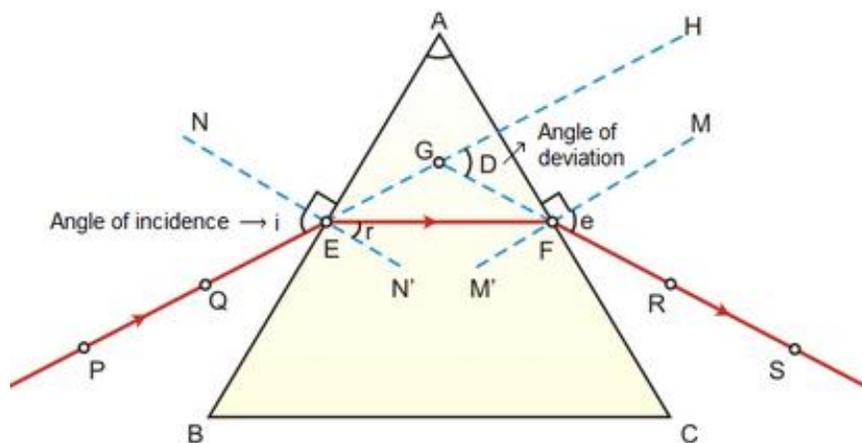


CBSE
Class X Science
Sample Paper – 6 Solution
Term II

SECTION A

1. Refractive index of a medium has no units. This is because, it is the ratio of speeds, and ratio of similar quantities is unit-less.
2. 3rd period, 2nd group
3. Barrier methods prevent sexually transmitted diseases; as, by this method, there is no direct contact of genital organs of male and female and thus, it also prevents transmission of infection.
- 4.



5. In reuse strategy, things are used again and again instead of throwing them. It is better than recycling of objects as no energy is used in this strategy.
6.
 - (a) $\text{CH}_3\text{CH}_2\text{OH} \xrightarrow{\text{O}_2} \text{CO}_2 + \text{H}_2\text{O} + \text{Heat}$
 - (b) $\text{CH}_3\text{CH}_2\text{OH} + \text{Na} \rightarrow \text{CH}_3\text{CH}_2\text{ONa} + \text{H}_2$
7. For the conservation of forests, following movements have started:
 - i. 'Chipko Movement' in the village of Garhwal started by Sundarlal Bahuguna.
 - ii. 'Appiko Movement' in Karnataka started by Pandurang Hegde.
 - iii. Another movement has been started by Amrita Devi Bishnoi for protection of 'khejri' trees in Khejarli village near Jodhpur.

8. Given:

Object distance, $u=10$ cm

Focal length, $f=15$ cm

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

$$\frac{1}{15} = \frac{1}{-10} + \frac{1}{v}$$

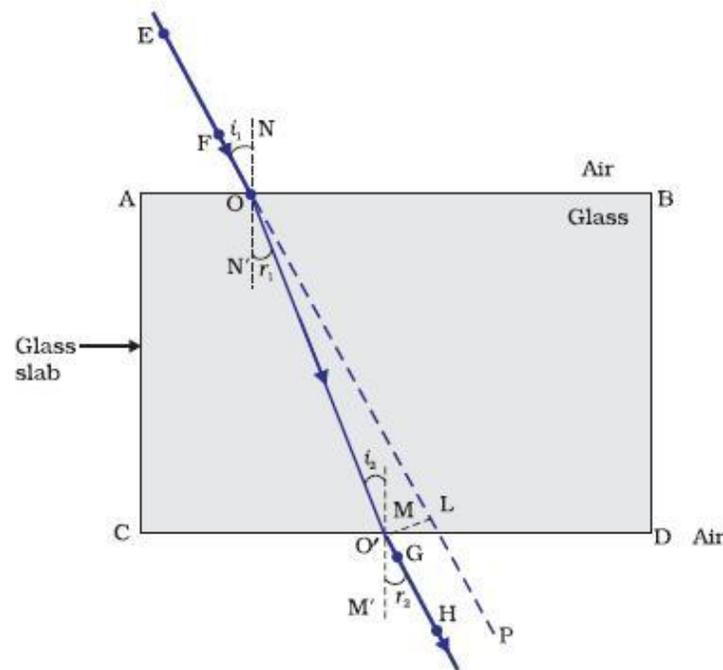
$$\frac{1}{v} = \frac{1}{15} + \frac{1}{10} = \frac{2+3}{30} = \frac{5}{30}$$

$$v = 6 \text{ cm}$$

Image is virtual, erect and diminished.

9.

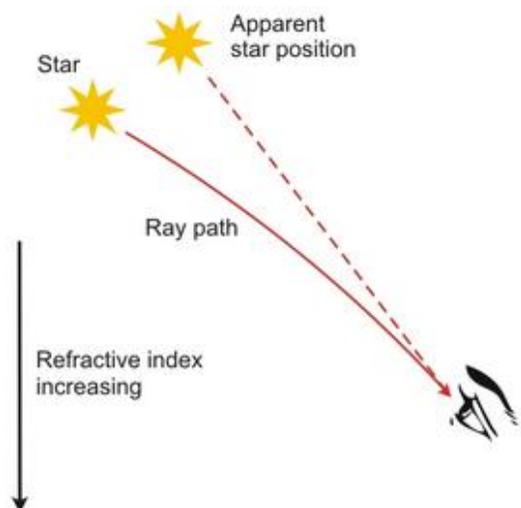
(a)



Refraction of light through a rectangular glass slab

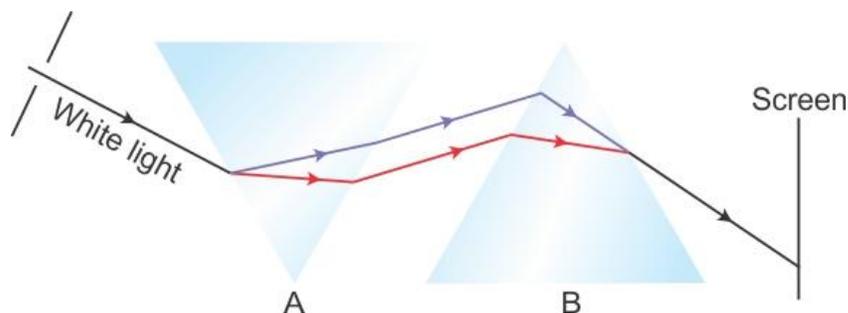
(b) The refractive index of diamond is 2.42 means that speed of light in diamonds is less than the speed of light in vacuum by an amount equal to 2.42.

10.



The light from star is refracted as it leaves space and enters the earth's atmosphere. Air higher up in the sky is rarer but that nearer the earth's surface is denser. So, as the light from a star comes down, the star appears to be at a higher position.

11.



Newton passed a beam of sunlight dispersed by glass prism P_1 through another identical prism P_2 held alongside the first prism but in an inverted position. The first prism disperses white light into seven colours, the second prism receives these seven colours and recombines them into the original white light. This observation gave Newton the idea that sunlight is made up of seven colours.

12.

(a) Period no: 3

Group no: 17

(b) It is a non-metal because it accepts electrons to complete its octet.

(c) The element is Chlorine (Cl) and its valency = 1

13.

(a)

Diamond	Graphite
(i) Each carbon atom is linked to four other carbon atoms.	(i) Each carbon atom is joined to only three other carbon atoms.
(ii) A diamond crystal has a tetrahedral arrangement of carbon atoms.	(ii) A graphite crystal has flat hexagonal rings structure.

(b) Due to its softness, powdered graphite can be used as a lubricant whereas diamond being extremely hard cannot be used as a lubricant.

14.

(a) Atomic radii decrease in moving from left to right along a period due to increase in nuclear charge which pull the electrons closer to the nucleus and reduces the size of the atom.

(b) Li: most metallic

F: most non-metallic

(c) Valency first increases from +1 to 4 and then decreases from -3 to 0.

15. Due to ozone layer depletion, ultraviolet rays reach the earth and cause certain ill-effects which are bad for us and for crops. Some of them are:

- Exposure to UV rays can lead to greater incidence of skin cancer, cataracts or other damages to the eye and immune deficiency.
- An excess of ultraviolet light decreases crop yield and reduce population of phytoplanktons, zooplanktons and certain fish larvae that are important constituents of aquatic food chains.
- It may also disturb global rainfall, causing ecological balance and bring about reduction in global food supplies.

16.

(a) Variation means certain change which occurs in sexually reproducing organisms because of errors in DNA copying.

(b) Variations are beneficial for species because they give survival advantage even in adverse environmental conditions.

17.

(a) Because black colour genes are more dominant than brown colour genes.

(b) Three black mice and one brown mouse will be obtained in F₂ generation. It is a monohybrid cross.

18.

- i. Within any population, there is natural variation. Some individuals have more favourable variations than others.
- ii. Even though all the species produce a large number of offsprings, populations remain fairly constant naturally.
- iii. This is due to the struggle between members of the same species and different species for food, space and mate.
- iv. The struggle for survival within populations eliminates the unfit individuals. The fit individuals possessing favourable variations survive and reproduce. This is called natural selection.
- v. The individuals having favourable variations pass on these variations to their progeny from generation to generation.
- vi. These variations when accumulated over a long period of time, lead to the origin of a new species.

19.

(a) Advantages of sexual reproduction are:

- i. Sexual reproduction promotes diversity of characters in the offspring.
- ii. In sexual reproduction, there are increasing opportunities for new combination of characters and therefore, it plays a prominent role in the origin of new species.
- iii. It leads to variation, which is necessary for evolution.

(b) The process by which an ovum is released from the ovary is called ovulation. The ovaries are composed of ovarian follicles and each follicle has an ovum covered by follicle cells. From the age of puberty, the ovary starts releasing one ovum once a month.

20.

(a) Convex lens is used by watch repair mechanics.

(b) Concave lens is used to get a virtual and diminished image of an object.

(c) case I:

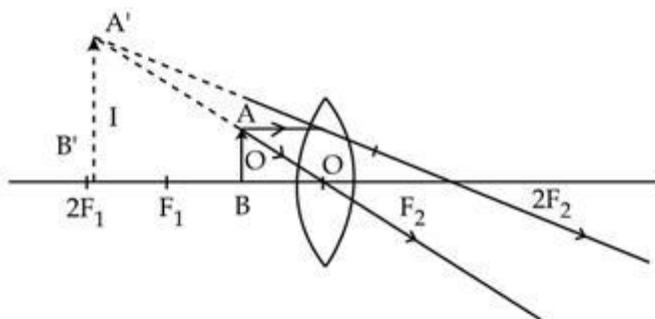


Image is virtual, erect, magnified and forms on the same side of the lens as the object.
case II:

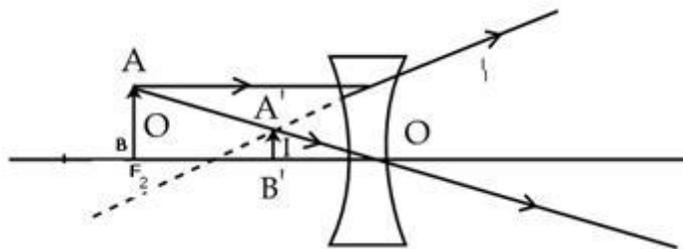
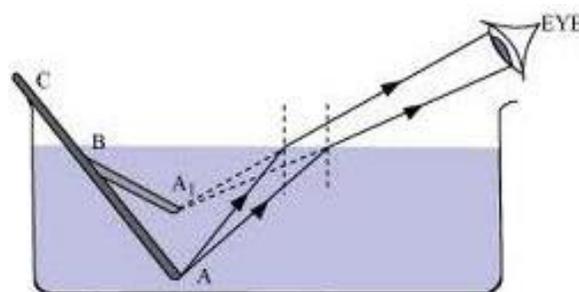


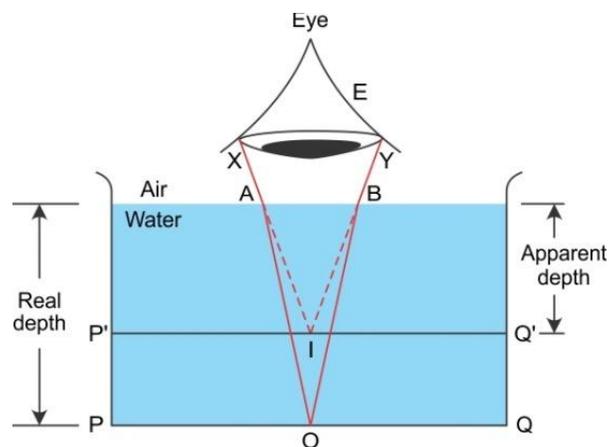
Image is virtual, erect, diminished and forms between the optical centre and the second principal focus of the lens.

21.

- (a) When a straight stick is partly immersed in water and held obliquely to the surface, it appears to be bent at the point where it enters water. This bending of stick is due to the refraction of light when it passes from water into air.



- (b) When we look into a pool of water, we don't see the actual bottom of the pool, we see a virtual image of the bottom of the pool which is formed by the refraction of light coming from the pool water into the air. Since the image of the bottom of the pool is formed nearer to us, we feel the pool is less deep.

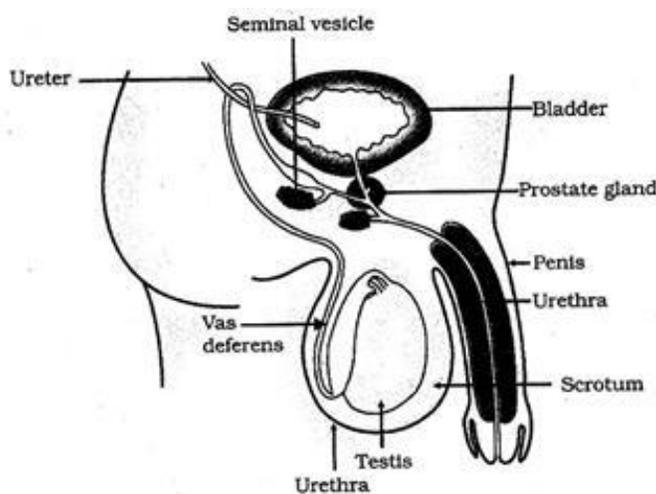


22.

- i. Elements in a period have same number of shells. Thus, elements A and B with two shells belong to same period i.e. second period. While C and D belong to the same period, 3rd with three shells.
- ii. Elements in a group have the same number of valence electrons. Thus, elements A and C belong to same group with 1 valence electron.
- iii. Elements having all shells completely filled belong to the 18th group (noble gases). Thus, elements B and D belong to the 18th group.
- iv. Owing to bigger size and weaker force of attraction of nucleus on the valence electron, element C is more reactive than element A.
- v. B is a noble gas; so, it does not form compounds. However, element A has only one valence electron; so, it forms maximum number of compounds by losing its valence electron easily.

23.

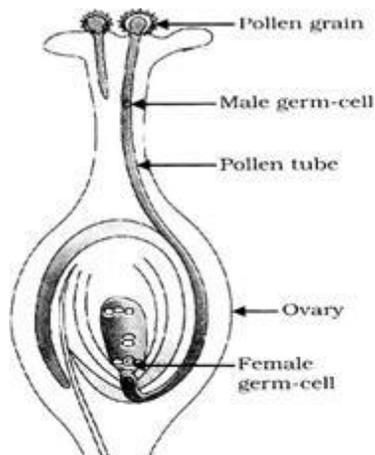
(a) Male reproductive system



- (b) Testis is situated outside the abdominal cavity because formation of sperm requires a lower temperature than normal body temperature.
- (c) Prostate gland and seminal vesicles secrete the fluid which provides nutrition to the sperms and makes their transport easier.

24.

(a)



(b) Advantages of cross pollination:

- i. More abundant and viable seeds are produced.
- ii. Cross pollination results into a healthier offspring.

SECTION B

25. (d) Lens and the screen and also between the tower and the screen.

Both the angles are to be measured with normal at the point of incidence as well as at the point of emergence.

26. (d)

Placing the mirror and screen in a stand will avoid any type of disturbance and inaccuracy during the experiment. Due to the reflecting nature of the mirror, the screen should be kept in front of the mirror.

27. (d) Ethyne and oxygen

A mixture of ethyne and oxygen is used for gas welding. The reaction is highly exothermic in nature.

28. (c) (iii)

Diagram (iii) shows the yeast cell with its nucleus and nucleus of the bud.

29. (c) Ethanoic acid solution

Ethanoic acid will give a reddish pink color with universal pH paper.

30. (d) An Amoeba with elongated nucleus and a constriction in the middle.

During binary fission of Amoeba, the nucleus gets elongated with a constriction in the middle.

31. (c) Acetic acid is corrosive and flammable.

32. (c) Dehydrating agent

During conversion of ethanol into ethene in the presence of conc. sulphuric acid, a molecule of water is lost. In this reaction, conc. sulphuric acid acts as a dehydrating agent.

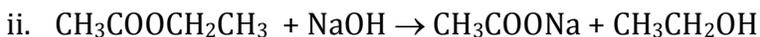
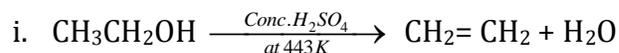
33. (d) A chain of bud cells

In yeast cell, the budding process continues three-four times resulting in a chain of yeast cells.

34. (a) Nucleus of bud, nucleus of Yeast

As 'c' is the parent organism, yeast whose nucleus is 'd' while 'a' is the bud whose nucleus is 'b'.

35.



36. (b) B, D, E

The normal drawn at the point of incidence are not generally at the top end of the upper boundary. A separation of nearly 6 cm between the pins will give greater accuracy in the result. The pin fixed on the paper may not be exactly perpendicular to the plane of paper. It is therefore, desirable to look at the feet of the pins or their images to get the refracted ray.