

# EDUCATION PARK

## Science (043): Class X

(2012-2013)

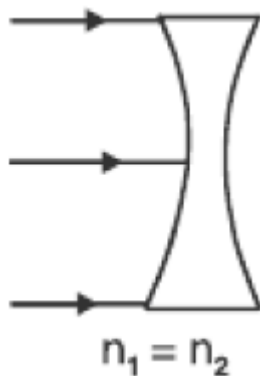
MM MARKS: 70]

[TIME: 3 HOUR

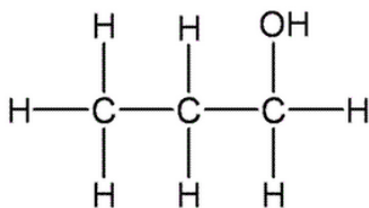
### General Instructions:

- Question no. 1 to 8 consist of one marks questions, which are very short answer type questions.
- Question no. 9 to 18 consist of two marks questions, which are short answer type questions.
- Question no. 19 to 27 consists of three marks questions, which are long answer type questions.
- Question no. 28 to 30 consists of five marks question, which are very long answer type question.
- All the questions are compulsory

1. A lens made of a material of refractive index  $n_1$  is kept in a medium of refractive index  $n_2$ . A parallel beam of light is incident on the lens. Complete the path of rays of light emerging from the lens:

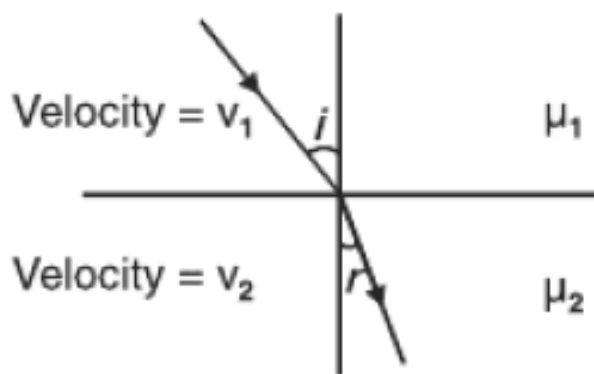


2. Name the products formed when ethane burns in :
- (a) Sufficient supply of air.
  - (b) Insufficient supply of air.
3. Lower half of the concave mirror is painted black. What effect will this have on the image of the object placed in front of the mirror.
4. Write IUPAC name of the following compounds:



5. Successful gamete transfer and fusion of gametes is essential for the most critical event in sexual reproduction.
- (a) Give the technical term for the fusion of gametes.
  - (b) What is formed as a result of fusion of gametes?

6. What is the ratio of  $\sin i$  and  $\sin r$  in terms of velocities in the given figure.



7. Which of the following hydrocarbon undergo addition reactions :  $C_2H_6$ ,  $C_3H_8$ ,  $C_3H_6$ ,  $C_2H_2$ , and  $CH_4$ .
8. If a woman is using copper-T will it help in protecting her from sexually transmitted disease?
9. Draw the electron dot structures of  
(a)  $C_2H_6$  (b)  $C_2H_4$

What happens when acetic acid reacts with  $NaHCO_3$ ? Represent it by chemical equation.

10. State the mode of reproduction for the following reproductive structures:

Reproductive Structure	Mode of Reproduction
Testis	-
Bud in Hydra	-
Filament of Spirogyra	-
Spore	-

11. An object is placed 20cm in front of mirrors  $M_1$  and  $M_2$  separately and image is found to be formed at a distance of 15 cm in front of it in case of  $M_1$  and behind it in case of  $M_2$ . Find the focal length and kind of mirror in each case.

**OR**

The image of an object placed at the centre of curvature of a lens will be formed at the same distance from the lens on the other side and that its size is the same as the object. Identify the lens and prove the statement.

12. Molecular formula of hydrocarbon (A) and (B) are  $C_3H_6$  and  $C_4H_{10}$  respectively. Which of these compounds will undergo addition reaction and which will undergo substitution reaction easily?  
(b) Draw the structures of (i) Butanone (ii) Pentanal
13. Arjun and Ram are students of Class-IX. Both were initially good in studies. After some time academic performance of Arjun started declining and he became irritable. This change was noticed by his class teacher the teacher, while interacting with Arjun found out that he had six siblings and whole family lived in a single room. Mother was not able to devote much attention to him and resources were not sufficient. After going through the situation, what are the factors, which you think, are responsible for change in behavior and his poor performance in studies.

14. The following data was recorded for values of object distance and the corresponding value of image distance in the experiment on study of real image formation by convex lens of power + 5D. One of these observations is incorrect identify this observation and give reason for your in choice.

S.No.	1	2	3	4	5	6
Object distance (cm)	25	30	35	45	50	55
Image distance (cm)	97	61	37	35	32	30

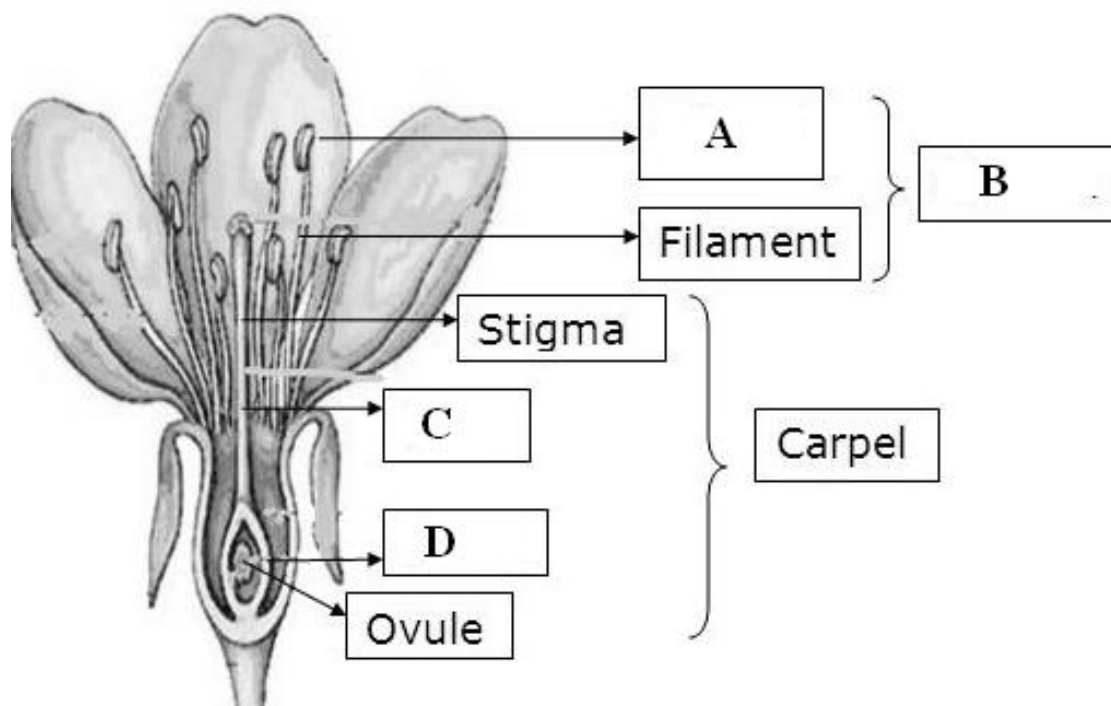
15. Give reasons for the following:

- (a) A concave mirror, used as a head mirror by an ENT specialist, can be used as a shaving mirror.
- (b) Convex mirror as a rear-view mirror in vehicles

16. Represent the following by balanced chemical reaction

- (a) Reaction of ethanol with hot conc. sulphuric acid.
- (b) Reaction of methane with chlorine in presence of sunlight
- (c) Reaction of ethanol with Sodium Metal Reaction of ethanoic acid with sodium hydroxide
- (d) Reaction of ethanoic acid with sodium hydroxide.

17. Identify the missing parts:



18. State with the help of the ray diagram, the formation of image of a finite object placed in front of a convex lens between  $f$  and  $2f$ . Give two characteristics of the image so formed.

19. Answer the following:

- (a) Illustrate with a diagram the process of reproduction which takes place in *Plasmodium*.
- (b) Write down the points of difference between asexual reproduction taking place between amoeba and the above given organism.

- 20.** Carbon is the sixth most abundant element in the universe. It has four electrons in its valence shell and forms covalent bonds. Due to its unique ability to form bonds with the other atoms of carbon it gives rise to large molecules that are exceptionally stable.
- (a) Which property of carbon enables it to form a large number of compounds?
  - (b) What are saturated and unsaturated hydrocarbons? Explain with example.
  - (c) What learning's for life can be associated with this property (ability to form bonds with other atoms) of carbon?
- 21.** Answer the following:
- (a) If light passes from one medium to another medium, what will happen to its frequency and wavelength?
  - (b) How can we identify that whether a given piece of glass is a convex lens, concave lens or a plane glass piece?
  - (c) Where and what is the nature of image formed by a convex lens , when object is placed at infinity?
- 22.** Answer the following:
- (a) Name one organ each in female and male reproductive system which play a role of endocrine gland along with production of germ cells. Name one hormone secreted by each of them.
  - (b) State two advantages of development of the embryo in the mother's womb.
  - (c) Where does fertilization occur in case of human female and name the place where fertilized egg gets implanted.
- 23.** A small candle 2.5 cm in size is placed 27 cm in front of a concave mirror of radius of curvature 36 cm. At what distance from the mirror should the screen be placed in order to receive a sharp image? Describe the nature and size of the image. If the candle were moved closer to the mirror, how would the screen have to be moved?
- 24.** In December 2011, at least 150 people died after consuming toxic alcohol in West Bengal. The residents of twelve villages in the South 24 Parganas district fell ill after drinking the alcohol. Many more people were being treated in the hospital, with fear of the death toll rising. Several died at home; fearing police would take action against them. Toxic alcohol deaths are a regular occurrence in India.
- After reading the above passage, answer the following questions:
- (a) As a science student, explain the major reason behind such tragedies.
  - (b) Do you think we can use alcohol as an additive in gasoline in India?
  - (c) Suggest two activities to prevent such type of tragedies in future.
- 25.** A doctor has prescribed a corrective lens of power + 2.0 D. Find the focal length of the lens. Generally, we observe that the adolescence age is the age of change in physical appearance, behavior, mental level, etc. Because of these changes, the child of this age always loves to stand in front of mirror and feel happy. But if we think little more, we will observe that the mirror reflect both image physical as well as internal feelings that is whatever we think is also reflected by mirror. Do you agree with this, comment on it?

**26.** Mr. R. Sharma was suffering from various types of diseases presently. He went for thorough health checkups and was diagnosed as HIV +ve. Soon this news spread in his neighborhood and on account of this, he faced social isolation.

Comment upon:-

- (a) Do you think people's indifference towards HIV+ve people is justifiable?
- (b) What kind of approach should we have towards the persons suffering from AIDS?
- (c) How can one protect oneself from these diseases?

**27.** An organic compound (A) is widely used as a preservative in pickles and has molecular formula  $C_2H_4O_2$ . It reacts with ethanol to form a sweet smelling compound 'B'.

- (a) Identify the compound (A).
- (b) Give the chemical reaction equation with ethanol to form compound (B).
- (c) How can we obtain compound (A) back from compound (B)?

**28.** Answer the following:

- (a) A spherical mirror forms an erect image three times the size of the object. If the sum of the image and the object distance is 100 cm, find the focal length.
- (b) In which direction will the ray of light bend, with respect to the normal, when it travels from Rarer medium to a denser medium. and denser medium to a rarer medium.

**OR**

An object is placed in front of a convex lens at a distance of  $f \pm \frac{f}{n}$ , where 'f' is the magnitude of the focal length of the lens.

Prove that the magnification produced by the lens is 'n'.

Also, find the two values of the object distances for which a convex lens of power 2.5 D will produce an image that is four times as large as the object.

**29.** Answer the following:

- (a) Give an example of a bisexual flower. What is its female reproductive part known as?
- (b) Pollination may occur without fertilization but fertilization will not take place without pollination. Give reason.
- (c) Draw a well labeled diagram of the male reproductive organ.

**OR**

Write the functions of *any five* amongst the following.

- (a) Uterus
- (b) Seminal vesicles
- (c) Urethra
- (d) Spore formation
- (e) Stamen
- (f) Carpels

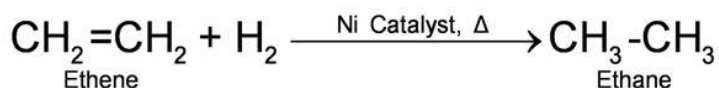
**30.** Answer the following:

- (a) Name the black substance of pencil. Will the current flow through the electrical Circuit when we use the sharpened ends of pencil to complete the circuit?
- (b) Compound 'A' is obtained from wood-tar distillation. It has specific smell and burning taste. It burns with blue flame to give  $\text{CO}_2$  and  $\text{H}_2\text{O}$ . It is soluble in water. It is used as a fuel and solvent. It reacts with sodium metal and gives out hydrogen gas. It reacts with acetic acid to form pleasant fruity smelling compound 'B' in presence of concentrated  $\text{H}_2\text{SO}_4$ . Identify 'A' and 'B' and give equations for all the reactions involved

**OR**

Answer the following:

- (a) Name the products formed when:
- (i) Ethanol burns in air.
  - (ii) Sodium ethanoate is heated with soda lime.
- (b) Will ethanol burn with sooty or non sooty flame? Give reasons also.
- (c) Name the reaction.



- (d) Vinegar is used as a food preservative. Name the acid present in it.