myCBSEguide.com
A Complete guide for CBSE students

SUMMATIVE ASSESSMENT – II
SCIENCE
Class – X

Time allowed : 3 hours **Maximum Marks : 90**

General Instructions :

(i) The question paper comprises of **two Sections, A** and **B**. You are to attempt both the sections.
(ii) **All** questions are **compulsory**.
(iii) There is no overall choice. However, internal choice has been provided. Only one option in such questions is to be attempted.
(iv) **All** questions of **Section-A** and **all** questions of **Section-B** are to be attempted separately.
(v) Question numbers **1** to **3** in **Section-A** are **one mark** questions. These are to be answered in **one word** or in **one sentence**.
(vi) Question numbers **5** to **11** in **Section-A** are **two marks** questions. These are to be answered in about **30 words** each.
(vii) Question numbers **12** to **23** in **Section-A** are **three marks** questions. These are to be answered in about **50 words** each.
(viii) Question numbers **24** to **27** in **Section-A** are **five marks** questions. These are to be answered in about **70 words** each.
(ix) Question numbers **28** to **43** in **Section-B** are multiple choice questions based on practical skills. Each question is a **one mark** question. You are to select one most appropriate response out of the four provided to you.

SECTION-A

1. Write the molecular formula of the following - (a) Hexane (b) Benzene
2. State the range of the human eye with a normal vision
3. Which of the following is/are biodegradable?
   Agricultural wastes, vegetable peels, polythene bags, aluminum foils
4. State and define the scientific term used for progressive accumulation of harmful chemicals at each trophic level of a food chain
5. State the basis of classification of element in the modern periodic table. How does the metallic character of element vary as we go down a group?
6. The atomic number of elements A, B, C, D and E are given below

Element	A	B	C	D	E
Atomic no.	7	10	12	41	9

   From the above table, answer the following questions-
   (a) Which two elements are chemically similar?
   (b) Which is an inert gas?
   (c) Which element belongs to 3rd period of periodic table?
   (d) Which element among these is a non metal?
7. Draw a labelled diagram to show the reproductive system of human female.
8. Name any two sexually transmitted disease (STDs). How do these infectious diseases spread from one person to another? Give two symptoms of STDs.
9. An object is placed at a distance of 20 cm in front of convex mirror of radius of curvature 30 cm. Find the position and nature of the image.
10. "Stars seem higher than they actually are" Explain, why?

myCBSEguide.com

11. What is meant by the power of accommodation of the eye? State the role of ciliary muscles in achieving it.
12. List two advantages associated with water harvesting at the community level.

" Management of natural resources requires a long-term perspective. " Comment on the statement.

13. Although coal and petroleum are produced by degradation of biomass, yet we need to conserve them, why?
14. Complete the following reactions
    (a) $CH_3\ CH_2\ OH \xrightarrow{\text{alkaline KMnO4 heat}}$?
    (b) $2Na + 2CH_3\ CH_2\ OH \longrightarrow$? + ?
    (c) $CH_3\ COOH + CH_3\ CH_2\ OH \xrightarrow{\text{Acid}}$?
15. Two elements X and Y belong to group 1 and 2 respectively in the same period of periodic table. Compare these elements with respect to
    I. number of electrons in their outermost orbit.
    II. their valences
    III. metallic character
    IV. their atomic size
    V. formula of their chlorides
    VI. formula of their sulphates
16. What is vegetative propagation? When is it used? List two uses.
17. Define evolution. Why are traits acquired during the life-time of an individual not inherited?
18. In humans, genetically the sex of a new born child is determined by the father and not by the mother." Justify this statement.
19. What are fossils? Give two uses of fossils. How does the study of fossils provide evidence in favour of organic evolution?
20. State the type of lens used as a simple magnifying glass. Draw a labelled ray diagram to show the image formation by this lens. List the characteristics of the image formed.
21. (i) Find the value of the angle of reflection when an incident ray makes an angle of 40° with a plane mirror.
    (ii) Light enters from air into water which has a refractive index of 1.33. Calculate the speed of light in water.
    (speed of light in air is 3×10^8 m/s.)
22. (a) What is long sightedness? List its causes.
    (b) How can it be corrected? Draw the ray diagram for its correction.
23. How is the sex of a new born determined genetically in humans?
24. Answer the following questions -
    (a) Write the name of the saturated hydrocarbon having two carbon atoms, Also write its chemical formula.
    (b) Define homologous series of a compound. Write the name and formula of next homologue of
    (i) $C_3\ H_8$ (ii) CH_3OH.
    (c) Explain why Carbon form compounds mainly by covalent bonding.

OR

    (a) What is detergent? Would you be able to check if water is hard by using a detergent? Justify your answer.
    (b) What is saponification? Explain the cleansing action of soap.
25. (a) List two reasons for avoiding frequent pregnancies by women.
    (b) Explain in brief the following method of contraception giving one example of each.
    (i) Barrier method
    (ii) Chemical method

myCBSEguide.com

(iii) Surgical method.

OR

(a) Draw longitudinal section of a flower to show its male and female reproductive parts. Label the following on it.
(i) Ovary (ii) Anther (iii) Filament (iv) Stigma

(b) Distinguish between self-pollination and cross-pollination.

(c) How does fusion of male and female gametes take place in plants?

26. Draw a ray diagram in each of the following cases to show the position and nature of the image formed when the object is placed

(i) between pole and principal focus of a concave mirror.

(ii) between centre of curvature and principal focus of a concave mirror.

Name the type of mirror which can be used to obtain a diminished and virtual image of an object. Mention an application of such a mirror . Draw a labelled ray diagram to show the formation of the required image in the mirror.

OR

Name the type of lens that can be used to obtain :

(i) A magnified and virtual image.

(ii) A diminished and virtual image of the object.

Draw labelled ray diagrams to show the formation of the required image in each of the above two cases. Which of these lenses can also form a magnified and real image of the object? Draw labelled ray diagram to show the position of object and image for such a lens.

27. Draw ray diagrams in the following cases to show the position and nature of the image formed by a concave mirror when an object is placed.

(i) between pole and focus

(ii) between focus and centre of curvature

(iii) at the centre of curvature How will the nature and position of image formed change in case (i) and (ii) if the concave mirror is replaced by a convex mirror ?

OR

Name the type of lens used to obtain.

(i) a magnified and virtual image of an object.

(ii) adiminished and virtual image of an object.

Draw labelled ray diagrams to show the formation of the required image in each of the above two cases. Which of these lenses could also form a magnified and real image of the object ? State the position of the object for which this could happen.

myCBSEguide.com

SECTION : B

28. Four groups of students I, II, III and IV were assigned separately the experiment of the interaction of iron nail with a solution of copper sulphate. Each group tried to record the observations as shown.

Group of students	Initial colour of solution	Final colour of solution	Change in the iron nail
I	Blue	Colourless	Grey coat
II	Green	Green	Reddish brown coat
III	Blue	Blue	Reddish brown coat
IV	Blue	Light Green	Reddish brown coat

myCBSEguide.com
A Complete guide for CBSE students

Which of the students recorded all the observations correctly ?

(a) (I) (b) II

(c) III (d) IV

29. Which one is not observed when aluminium is added to a solution of ferrous sulphate?
(a) The solution is light green in the beginning.
(b) The final solution becomes colourless.
(c) The final solution becomes a dark blue.
(d) A dirty mass is deposited on the surface of alluminium.

30. Which of the following statement is not correct?
(a) Acetic acid is a weak acid and it ionizes only partially
(b) Acetic acid turns red litmus blue but it does not affect blue litmus
(c) Acetic acid is highly soluble in water.
(d) Acetic acid reacts with sodium hydrogen carbonate to form a colourless and odorless gas.

31. What will you observe when solid sodium bicarbonate is added to acetic acid.
(a) Solution turns light green
(b) Brown fumes evolved
(c) Brick effervescence occurred
(d) A pungent smelling gas is evolved

32. When solid sodium bicarbonate is added to ethanoic acid, a gas is liberated. which one of the following statements is not true about this gas?
(a) It turns lime water milky
(b) It extinguishes a burning splinter.
(c) It dissolves in a solution of sodium hydroxide
(d) It turns potassium dichromate solution green

33. A student was asked to obtain real image of a tree on the screen with the help of suitable mirror. He can do so by taking a -
(a) concave mirror
(b) plane mirror
(c) convex mirror
(d) both either by concave or by convex mirror

34. A student obtained a sharp image of a distant tree on the screen placed behind the convex lens. He then removed the screen and tried to look through the lens in the direction of the tree. He would now see
(a) An erect image of the tree on the lens.
(b) An inverted image of the tree at the focus of the lens
(c) No image as there is no screen.
(d) Blurred image on the wall of the laboratory.

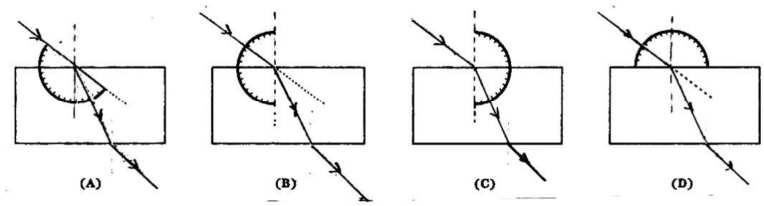
35. Your friend is performing an experiment on determining the focal length of the given convex lens by obtaining the image of a distant object on the screen. Out of the following clearly visible object which one would you suggest to use as the object for his experiment to get best results.
(a) A lighted candle kept at the other end of the laboratory table.

myCBSEguide.com

myCBSEguide.com
A Complete guide for CBSE students

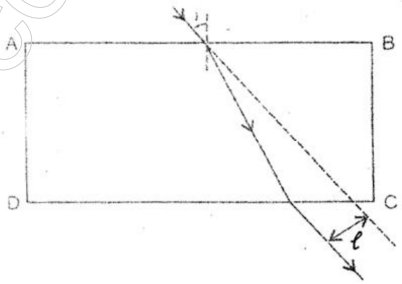
(b) Any distant tree.
(c) Window grill in the laboratory.
(d) A well illuminated distant tree.

36. A student traces the path of a ray of light passing through a rectangular glass slab.
For measuring the angle of incidence, he must position the protractor in the manner as shown in the figure.



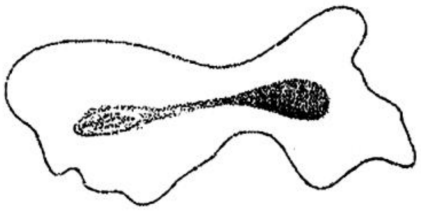
(a) A (b) B
(c)C (d) D

37. A student traces the path of a ray of light passing through a rectangular glass slab for three different angle of incidence (i), namely 30°, 45°, 60°. He produces the incident ray and measures the perpendicular distance 'l' between the produced incident ray and emergent ray.



He will observe that the distance 'l'
(a) keeps on increasing with increase in angle of incidence.
(b) keeps on decreasing with increase in angle of incidence.
(c) remains the same for all three angles of incidence.
(d) is maximum for i=45° and is less than this value both for i=30° and i=60°

38. The diagram given below illustrates



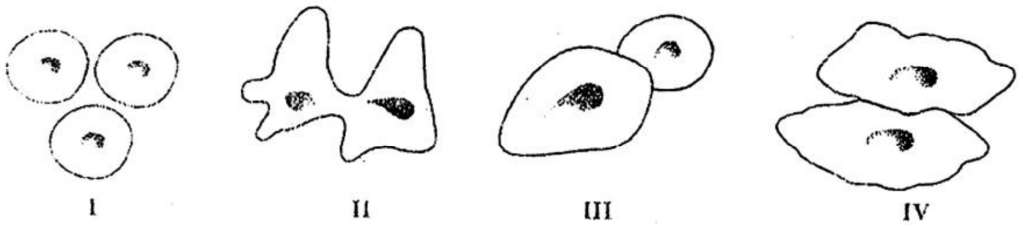
(a) bud formation in yeast
(b) binary fission in Amoeba.
(c) formation of daughter cells in yeast.
(d) pseudopodia formation in amoeba

39. The figures given below illustrate binary fission in Amoeba but the steps are not in proper sequence.
The correct sequence of the process is:

(a) IV, II, I, III (b) II, IV, I, III
(c) IV, I, II, III (d) II, I, IV, III

40. Out of four slides I, II, III, IV whose details are shown below, which one should be focused under the microscope for showing budding in yeast?

myCBSEguide.com
A Complete guide for CBSE students



(a) I
(b) II
(c) III
(d) IV

41. Which one of the following sketches does not illustrate budding in yeast?

(a) I
(b) II
(c) III
(d) IV

42. Some raisins weighed 10g before they were placed in water for two hours. The raisins were then removed, wiped and weighed again. Their weight was now found to be 12.5g. The percentage of water absorbed by raisins is :
(a) 2.5%
(b) 5%
(c) 12.5%
(d) 25%

43. An experiment was set-up to determine the percentage of water absorbed by raisins. If the mass of dry raisins was 40g, and mass of wet raisins was 45g, the percentage of water absorbed would be.
(a) $\frac{45g}{40g}$x100
(b) $\frac{40\ g}{45g}$ x100
(c) $\frac{45g-40\ g}{40g}$x100
(d) $\frac{45g-40\ g}{45g}$x100

myCBSEguide.com

myCBSEguide.com
A Complete guide for CBSE students

SUMMATIVE ASSESSMENT – II
Class – IX SCIENCE

Solution

Section - A

1. Hexane-C_6H_{14}
   Benzene-C_6H_6

2. 25 cm to infinity

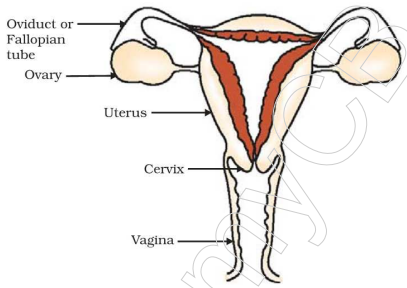
3. Agricultural residue, sewage.

4. Biomagnification or Ecological amplification

5. (i) Atomic number
   (ii) Down the group, the effective nuclear charge experienced by valence electrons is decreasing because the outer most electrons are further away from the nucleus. Therefore, these can be lost easily. Hence metallic character increases down a group.

6. (a) C & D
   (b) B
   (c) C
   (d) A

7. Reproductive system of human female



8. Syphilis, gonorrhoea , AIDS, Warts.
   These infectious diseases spread from one person to another by sexual contact with an infected person.
   Burning sensation at urination, urethral discharge, sores in genitals.

9. Here, u= -20 cm, r=30 cm , f= R/2 = 30/2 = 15 cm
   Using mirror formula and substituting the above values we get
   v=60/7 cm. So, The image will be formed at distance of 60/7 cm behind the mirror.
   Nature : virtual and erect.

10. Stars are independent sources of light, situated very far away from earth. Light from a star first in vacuum and then enters earth's atmosphere. As optical density of air increases towards the

surface of earth, light from the star travels from rarer to denser layers, bending every time towards normal. On producing the final refracted ray backwards, it is seen that the apparent position of the star is higher.

11. (i) The ability of an eye to adjust the focal length of the eye lens with the help of ciliary muscles so as to see the nearby as well as distant objects clearly.
(ii) Ciliary muscles help by contracting and expanding.

12. 1. Ground water level increases
2. Water can be stored during rainy season and can be used when required
3. Ground water keeps the layers of soil above it moist and prevents loss of water by evaporation.
   (a) So that they can last for generations to come since their source is limited.
   (b) To ensure equal distribution of natural resources to all people.

13. Both the energy sources coal and petroleum take millions of years for their formation.
As these resources are being utilized as much faster rate than their formation, they will be exhausted in the near future, hence they need to be conserved.

14. (a) CH_3 COOH
(b) $2CH_3CH_2ONa$, H_2
(c) CH_3 COO CH_2 CH_3 or CH_3 $COOC_2H_5$

15. (i) Number of elections in the outermost orbit of X=1 and Y=2
(ii) Valency of X=1 and Y=2
(iii) Metal X is more metallic than Y
(iv) Atomic size of X is bigger than that of Y
(v) Chloride XCl; YCl_2
(vi) Sulphate X_2SO_4; YSO_4

16. It is an asexual method of reproduction. In this process, vegetative part of a plant body like stem, leaves, bulbs, tubers are used for growing new plants by cutting, graftings and layering which are identical to parents.
It is used to grow
(a) plants that have lost the capacity to produce seeds.
(b) plants genetically similar enough to the parents plants.

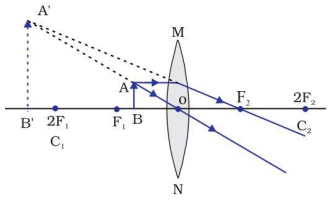
17. The gradual unfolding of organisms from pre-existing organisms through change since the origin of life is known as evolution
The traits acquired by an organism during the life time are not inherited. Because these changes occur in non-reproductive tissues.

18. Human males produce two type of gametes (50% X and 50% Y chromosomes)
Human female produce one type of gametes (all with X chromosomes).
Fertilization of ovum with a sperm carrying X chromosome gives rise to a female child
While its fertilization with a sperm carrying Y chromosome gives rise to a male child.
Thus genetically the sex of the child is determined by what they inherit from their father and not by mother.

myCBSEguide.com

19. The remains or impressions of dead animals or plants that lived in the remote past are known as fossils.
Uses;
(a) Racial history of plants.
(b) Past climatic conditions of earth.
(c) To measure the geological time.
About the process of evolution the fossils indicates that;
(1) Fossils helps to identify an evolutionary relationship between apparently different species.
(2) The fossils present in the bottom rocks are simple while the most recent fossil found in the upper strata are highly complex. This geographical succesttion completely agrees with the concept of evolution.

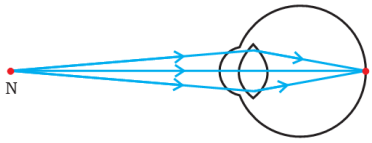
20. Convex lens



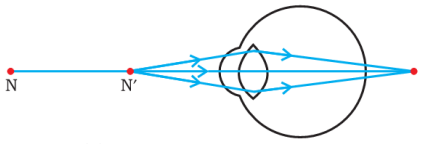
Virtual, erect and magnified

(i) r = ∟i = 90°- 40° = 50°
(ii) Here, $n_w = 1.33$,$n_w = c/v_w$, $1.33 = 3x108/v_w$, $v_w = 3x10^8/1.33 = 2.26x10^8$m

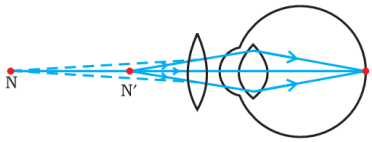
22. Hypermetropia is also known as far-sightedness. A person with hypermetropia can see distant objects clearly but cannot see nearby objects distinctly. The near point, for the person, is farther away from the normal near point (25 cm). Such a person has to keep a reading material much beyond 25 cm from the eye for comfortable reading. This is because the light rays from a close by object are focussed at a point behind the retina as shown in Fig. (b). This defect arises either because (i) the focal length of the eye lens is too long, or (ii) the eyeball has become too small. This defect can be corrected by using a convex lens of appropriate power. This is illustrated in Fig. (c). Eye-glasses with converging lenses provide the additional focusing power required for forming the image on the retina.



(a) Near point of a Hypermetropic eye



(b) Hypermetropic eye



(c) Correction for Hypermetropic eye

23. Humans have 1 pair of sex chromosomes along with 22 identical pairs of chromosomes
Women have a perfect pair of sex chromosomes
Men have one X and one Y
All the children will inherit X chromosomes from their mother
The child who inherits the X chromosome from the father will be a girl
And one who inherits Y chromosome will be a boy
Thus the sex of the child will be determined by what they inherit from their father

24. (a) Ethane(C_2H_6)

(b) Homologous series – A series of compounds in which the same functional group substitutes for hydrogen in a carbon chain is called a homologous series.
$C_4 H_{10}$ – butane
C_2H_5OH – ethanol

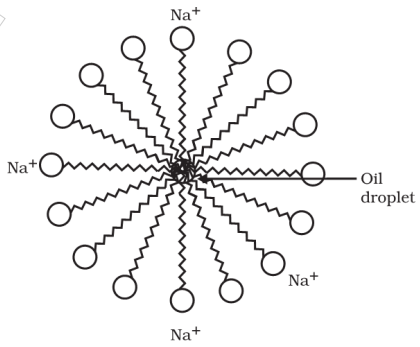
(c) Being tetravalent carbon atom is neither capable of losing all of its four valence electrons nor it can easily accept four electrons to complete its octet. If carbon were to gain or lose electrons –

(i) It could gain four electrons forming C_4^- anion. But it would be difficult for the nucleus with six protons to hold on to ten electrons, that is, four extra electrons.

(ii) It could lose four electrons forming C_4^+cation. But it would require a large amount of energy to remove four electrons leaving behind a carbon cation with six protons in its nucleus holding on to just two electrons.
Carbon overcomes this problem by sharing its valence electrons with other atoms of carbon or with atoms of other elements.

OR

(a) Detergents are Sodium salt of long chain benzene sulphonic acid.
No, we would not be able to check whether a sample of water is hard by using a detergent because a detergent forms lather easily even in hard water.
Soap is the sodium or potassium salt of organic acid. Most dirt is oily by nature, soap molecules form structures called MICELLES, where one end of the molecule is towards the oil droplet, the ionic end faces outside. This forms an emulsion in water, Which helps in pulling out the dirt from the fabric and the soap micelle helps in dissolving the dirt in water.



25. (a) 1. It has adverse effect on the health of women.
2. It increases the rate of the population of our country.

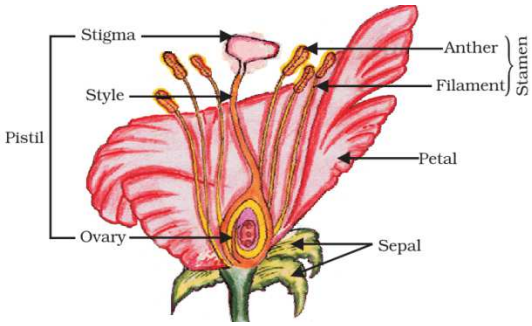
(b) (i) Barrier method ; In this method , a device is used to prevent the entry of sperms in the female genital tract during sexual intercourse.
Example : Condom, diaphragm and cervical cap.

(ii) Chemical method ; It involves the use of specific drugs by females.
Example: Oral pills, vaginal pills, OC.

(iii) Surgical method ; surgical removal or ligation of vas deferens in males and the fallopian tube in females there by preventing production of male and female gametes.

OR

(a) longitudinal section of flower



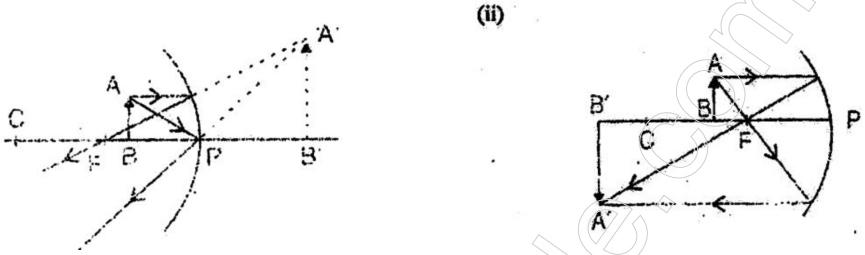
myCBSEguide.com
A Complete guide for CBSE students

(b) Self-pollination is the transfer of pollen grains from anthers flower to the stigma of the same flower or another flower of the same plant.
Occurs in bi sexual flowers.
Cross pollination is the transfer of pollen grains from anthers to the stigma of another flower borne on another plant of the same species.
Occurs in unisexual flowers as well as bi sexual flowers.

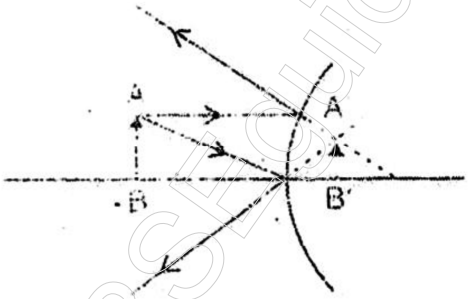
(c) The pollen tube which carries male gamete, travels through the style to reach the ovary. The ovary contains ovules. Each ovule has an egg cell. The fusion of male gamete and female gamete, called fertilization, gives rise to the zygote.
The zygote is capable of growing into a new plant.

26.

(i) (ii)



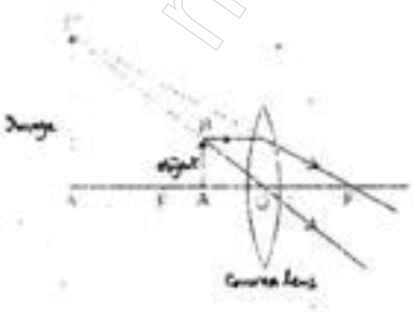
Convex mirror

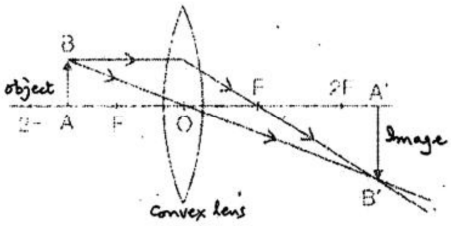


Car's rear view mirror

OR

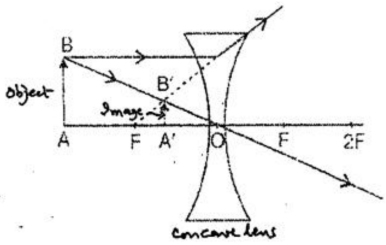
(i) Convex lens



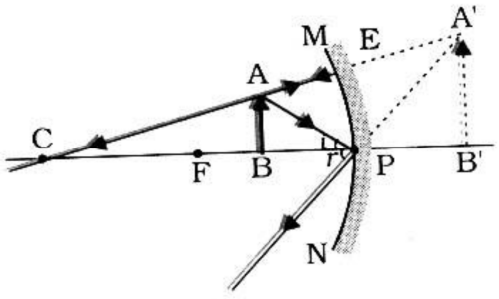


myCBSEguide.com
A Complete guide for CBSE students

(ii) Concave lens

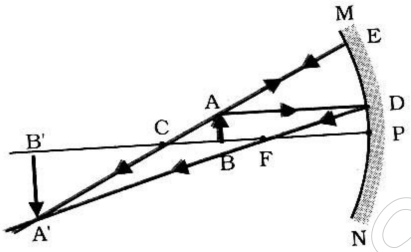


27. (i)



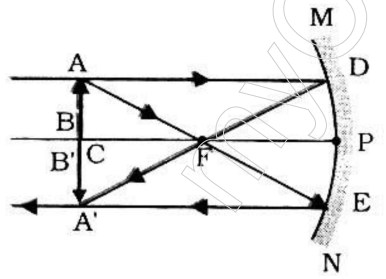
Virtual, Erect and Behind the mirror

(ii)

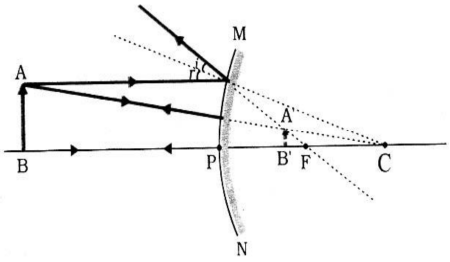


Enlarged, Real and Inverted; Beyond C

(iii)



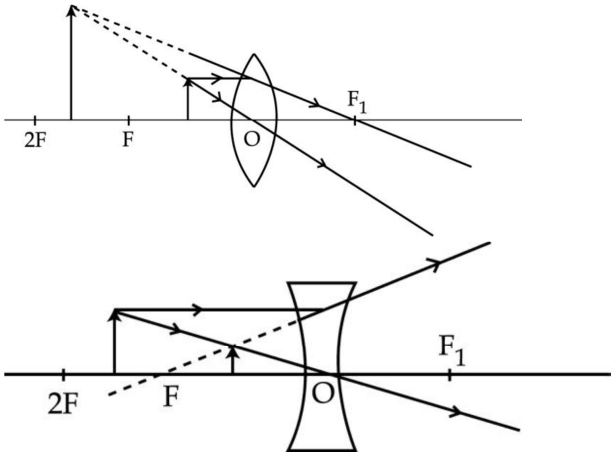
At C, same size, real and inverted In both cases virtual, erect and diminished, Image will be formed between P and F behind the mirror.



OR

myCBSEguide.com
A Complete guide for CBSE students

(i) convex lens (ii) concave lens



Convex lens can also form a magnified and real image of an object. Object should be placed between F and 2F.

SECTION-B

28.(d)	29.(c)	30.(b)	31.(c)	32.(c)	33.(a)
34.(b)	35.(d)	36.(b)	37.(a)	38.(b)	39.(a)
40.(c)	41.(c)	42.(d)	43.(c)		

myCBSEguide.com