

Question Paper 2011 Outside Delhi set 1
CBSE Class 10 Science

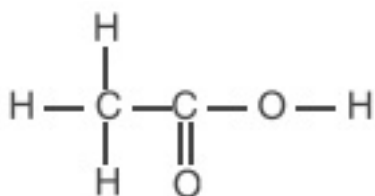
GENERAL INSTRUCTIONS:

- (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 in all the three questions of five marks category. Only one option in such question 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 4 in section A are one mark questions. These are to be answered in one word or one sentence.
- (vi) Question numbers 5 to 13 are two mark questions, to be answered in about 30 words each.
- (vii) Question numbers 14 to 22 are three mark questions to be answered in about 50 words each.
- (viii) Question numbers 23 to 25 are five mark questions, to be answered in about 70 words each.
- (ix) Question numbers 26 to 41 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. Draw the structure for ethanoic acid molecule, CH_3COOH .

Ans.



2. Give an example of a phenomenon where Tyndall effect can be observed.

Ans. Reddening of the sun at sunrise and sunset / appearance of blue colour of sky / passing of light through a colloidal solution / beam of light enters a smoke-filled room through a small hole, particles of smoke become visible. or any other suitable example.

3. What is meant by biological magnification?

Ans. Progressive accumulation of harmful nonbiodegradable chemicals in the bodies of living organisms at each trophic level / in a food chain.

4. Give an example to illustrate that indiscriminate use of pesticides may result in the degradation of the environment.

Ans. Indiscriminate use of DDT / pesticide has led to degradation of soil / water bodies.

5. How does the valency of elements vary (i) in going down a group, and (ii) in going from left to right in a period of the periodic table?

Ans. i) It remains the same.

ii) It first increases and then decreases

6. In the modern periodic table, the element Calcium (atomic number= 20) is surrounded by elements with atomic numbers 12, 19, 21 and 38. Which of these elements has 7. physical and chemical properties resembling those of Calcium and why?

Ans. The element with atomic number 12 / 38 (or both) Reason: These elements have same number of valence elements as calcium.

7. State any four characteristics of the image of an object formed by a plane mirror.

Ans. i) Erect

ii) Laterally inverted

iii) Same size as the object

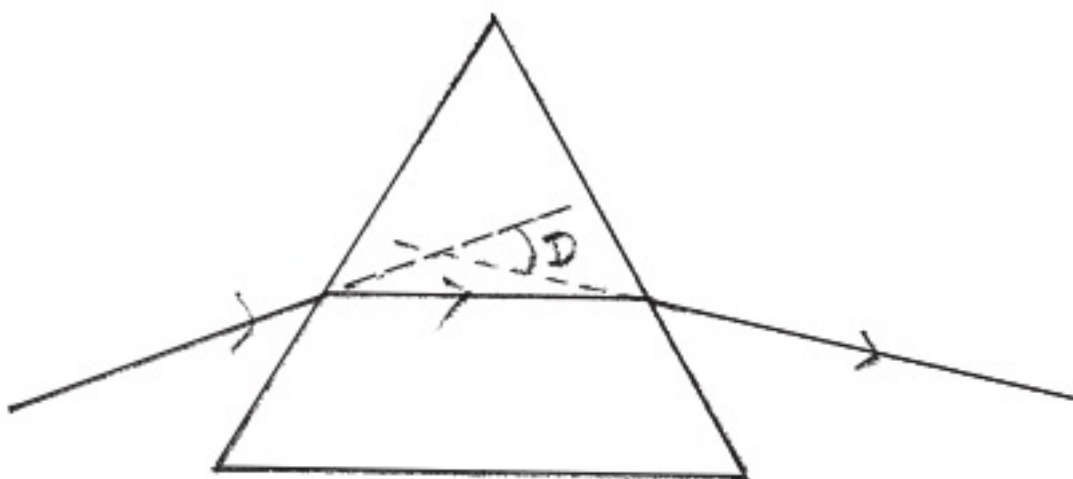
iv) As far behind the mirror as the object in front of it / image distance = object distance

(v) Virtual

Any 4 Characteristics

8. Draw a ray diagram to show the refraction of light through a glass prism. Mark on it (a) the incident ray, (b) the emergent ray and (c) the angle of deviation.

Ans.



(a) PQ = incident ray

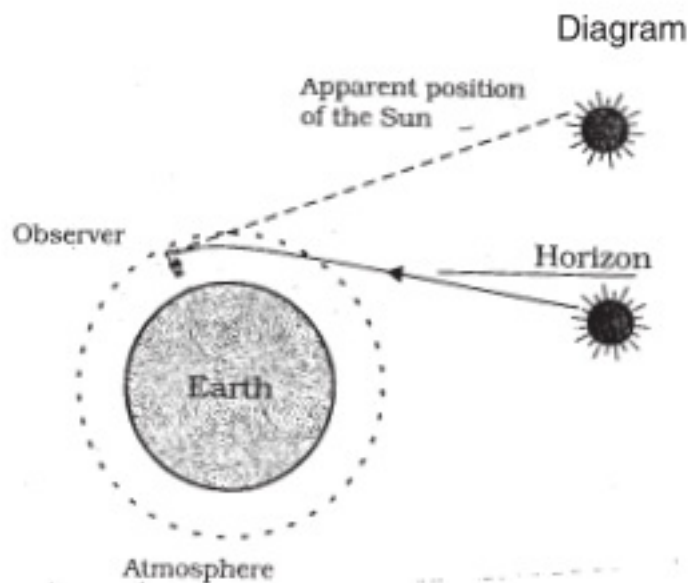
(b) RS = emergent ray

(c) $\angle D$ - angle of deviation

Diagram (above) with directions.

9. Explain with the help of a diagram, how we are able to observe the sunrise about two minutes before the sun gets above the horizon.

Ans.



Since atmosphere near the earth is denser so ray of light when enters from rarer to denser medium keeps bending towards the normal. To the observer, these rays appear to come from apparent position which is above the horizon.

10. List any four reasons for vegetative propagation being practiced in the growth of some type of plants.

Ans. it is the only method of multiplication of those plants which do not produce viable seeds.

- they can bear flowers and fruits earlier than those produced from seeds.
- cheaper, easier and rapid method of propagation
- all plants are genetically similar to the parent plant.

11. Describe the role of fallopian tubes in the female reproductive system.

Ans. a) The egg is carried from the ovary to the womb through the fallopian tubes.

b) Fertilisation takes place in the fallopian tubes.

12. List any four disadvantages of using fossil fuels for the production of energy.

Ans. 1. The fossil fuels are non-renewable sources of energy.

2. Air-pollution is caused by burning of fossil fuels.

3. The oxides of C, S and N are released on burning fossil fuels which lead to acid rain.
4. CO₂ produced by burning these fuels causes greenhouse effect.

13. Give two examples each of the following:

(i) Renewable sources of energy

(ii) Non-renewable sources of energy

Ans. Renewable resources : Forest, Sun (any other)

Non-renewable resources : coal, petroleum (any other)

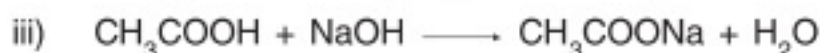
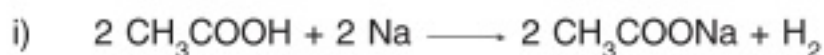
14. Write chemical equations for what happens when:

(i) sodium metal is added to ethanoic acid.

(ii) solid sodium carbonate is added to ethanoic acid.

(iii) ethanoic acid reacts with a dilute solution of sodium hydroxide.

Ans.



Note: Full marks to be awarded if the products are correct.

15. The atomic number of an element is 16. Predict:

(i) the number of valence electrons in its atom.

(ii) its valency.

(iii) its group number.

(iv) whether it is a metal or a non-metal.

(v) the nature of oxide formed by it.

(vi) the formula of its chloride.

Ans. i) 6

ii) 2

iii) 16th

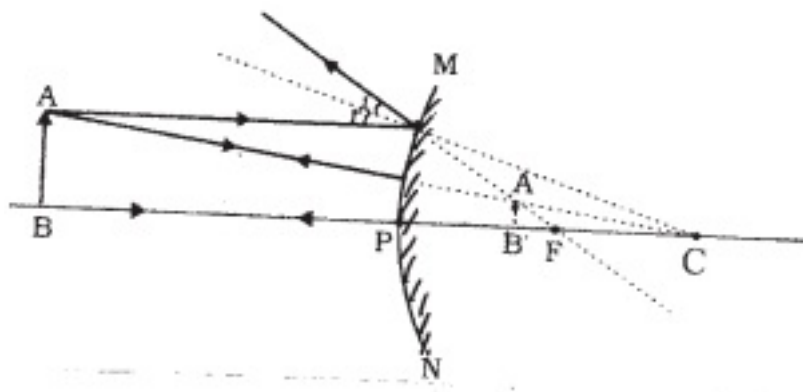
iv) Non-metal

v) Acidic

vi) XCl_2 (any other symbol in place of X may be accepted)

16. An object is placed between infinity and the pole of a convex mirror. Draw a ray diagram and also state the position, the relative size and the nature of the image formed.

Ans.



Position – Between P and F behind the mirror

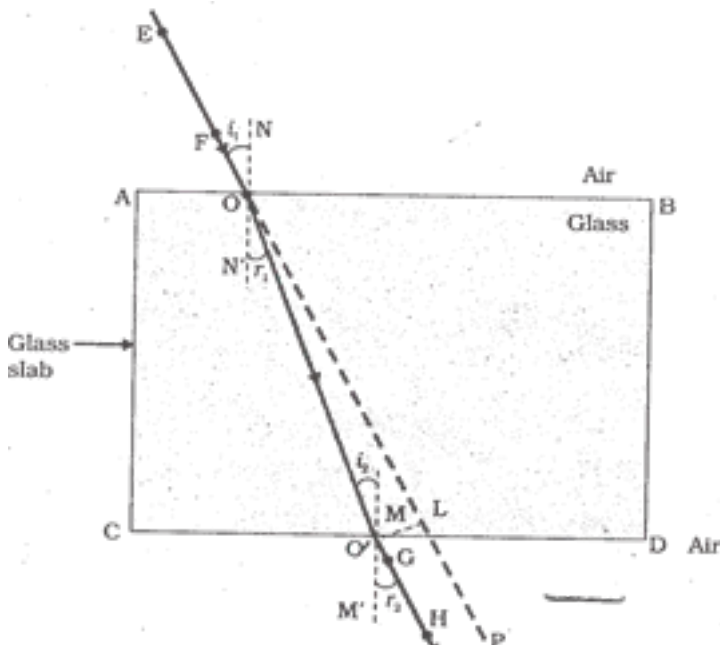
Size – Diminished

Nature – Virtual and erect

17. What is the principle of reversibility of light? Show that the incident ray of light is parallel to the emergent ray of light when light falls obliquely on a side of a rectangular glass slab.

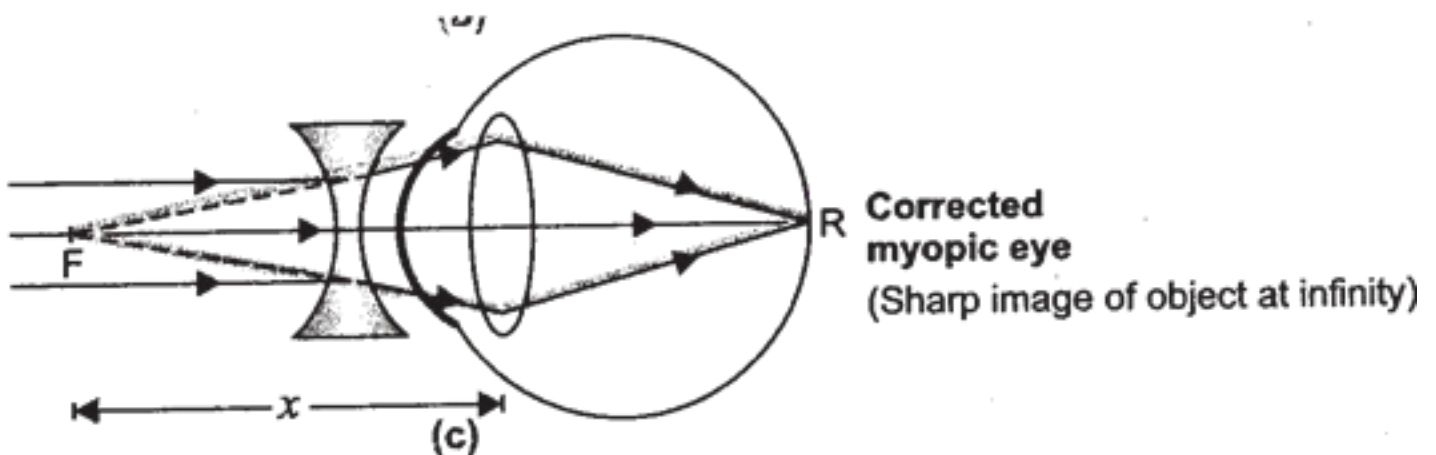
Ans. Principle of reversibility of light —

If the path of a ray of light is reversed after suffering a number of refractions then it retraces its path i.e. the path of a ray of light is reversible



18. What eye defect is myopia? Describe with a neat diagram how this defect of vision can be corrected by using a suitable lens.

Ans. Defect of vision in which the person can clearly see nearby objects but distant objects can't be seen clearly by him.



It can be corrected by using a concave lens / diverging lens of suitable power.

19. What does HIV stand for? Is AIDS an infectious disease? List any four modes of

spreading AIDS.

Ans.

- HIV: Human Immunodeficiency Virus
- Yes
- Modes of spreads

1) use of infected needles and syringes.

2) transfusion of infected blood.

3) from infected mother to the child.

4) unsafe sexual contact with the AIDS infected partner.

Note: One Marks to be awarded to any one mode

20. Describe any three ways in which individuals with a particular trait may increase in population.

Ans. 1) Survival Advantage / Natural selection: For eg. in a population of red and green beetles, green got a survival advantage and increased in number.

2) Accidental advantage / genetic drift, taking example of natural or man- made calamities whereby a population decreases in number, few survive and increase in number.

3) Suitable adaptation ability to cope up in adverse environmental conditions.

21. State the evidence we have for the origin of life from inanimate matter.

Ans.

22. What are fossils? What do they tell us about the process of evolution?

Ans.

- Fossils are the remains or traces of animals and plants of the past found embedded in rocks.

- Pre-historic organisms existed in the past and now extinct.
- Evolutionary relationship of organisms can be studied.

23. (a) State two properties of carbon which lead to a very large number of carbon compounds.

(b) Why does micelle formation take place when soap is added to water? Why are micelles not formed when soap is added to ethanol?

OR

Explain isomerism. State any four characteristics of isomers. Draw the structures of possible isomers of butane, C_4H_{10} .

Ans. 1) Catenation

2) Tetravalency

3) Isomerism

4) Multiple bond formation (any two)

The ionic part (hydrophilic part) of the soap molecule dissolves in water due to its similar (polar) nature to water, so micelles are formed.

Since there is no ionic / charged part in ethanol molecule, no micelle is formed.

OR

The phenomenon due to which organic compounds having the same molecular formula have different structures is called isomerism.

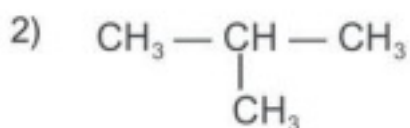
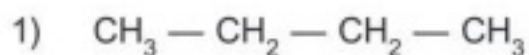
Characteristics

1. Isomers have same molecular formula.
2. Isomers have different structural formulae.
3. Isomers have same molecular mass.

4. Isomers have different physical properties.
5. Isomers have different chemical properties.

Note: Any four characteristics

Two structures :



24. (a) What is meant by 'power of a lens'?

(b) State and define the S.I. unit of power of a lens.

(c) A convex lens of focal length 25 cm and a concave lens of focal length 10cm are placed in close contact with each other. Calculate the lens power of this combination.

OR

(a) Draw a ray diagram to show the formation of image of an object placed between infinity and the optical centre of a concave lens.

(b) A concave lens of focal length 15 cm forms an image 10 cm from the lens. Calculate:

(i) the distance of the object from the lens.

(ii) the magnification for the image formed.

(iii) the nature of the image formed.

Ans. a) Reciprocal of focal length of a lens / Degree of convergence or divergence of light rays achieved by a lens.

b) Unit — dioptre

1 dioptre is the power of a lens whose focal length is 1 metre

$$(c) f_1 = +25\text{cm} = \frac{+25}{100} \text{ m}$$

$$P_1 = \frac{1}{f_1} = + \frac{100}{25} = + 4\text{D}$$

$$f_2 = -10 \text{ cm} = \frac{-10}{100} \text{ m}$$

$$P_2 = \frac{1}{f_2} = \frac{-100}{10} = -10 \text{ D}$$

$$P = P_1 + P_2 = + 4\text{D} - 10\text{D} = - 6\text{D}$$

OR

(a)

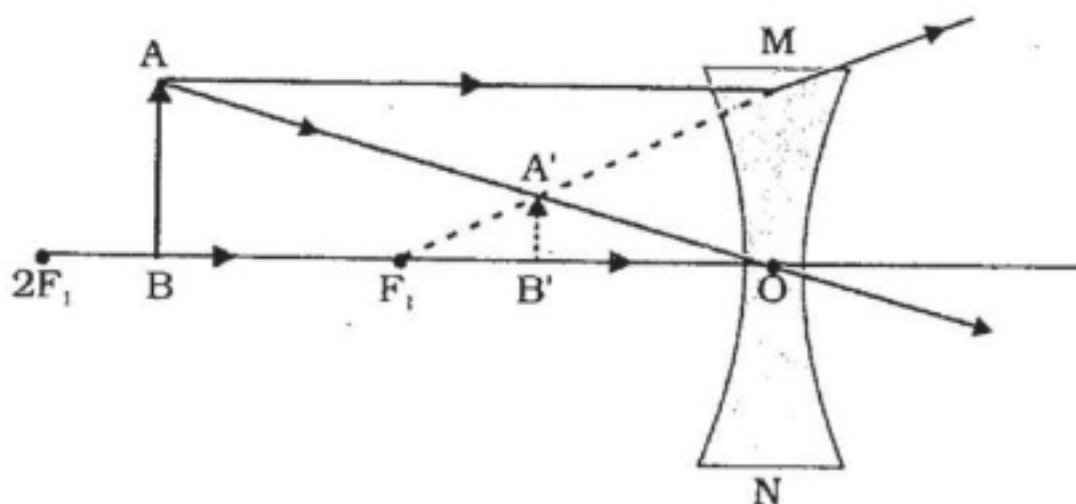


diagram
correct directions

$$(b) (i) \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

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

$$= \frac{1}{(-10)} - \frac{1}{(-25)}$$

$$= \frac{-3+2}{30}$$

$$= -\frac{1}{30}$$

$$\therefore u = -30cm$$

$$(ii) m = \frac{v}{u}$$

$$= \frac{-10cm}{-30cm} = +\frac{1}{3}$$

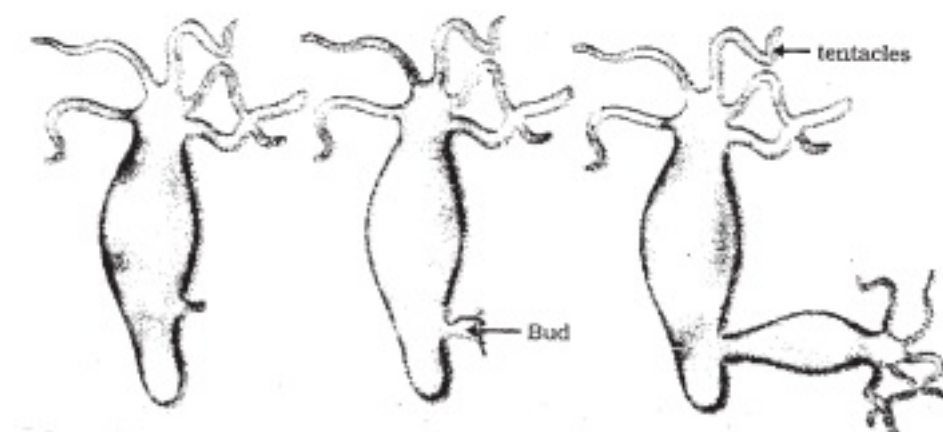
(ii) Nature: virtual and erect

25. With the help of suitable diagrams, explain the various steps of budding in Hydra.

OR

What is binary fission in organisms? With the help of suitable diagrams, describe the mode of reproduction in Amoeba.

Ans.

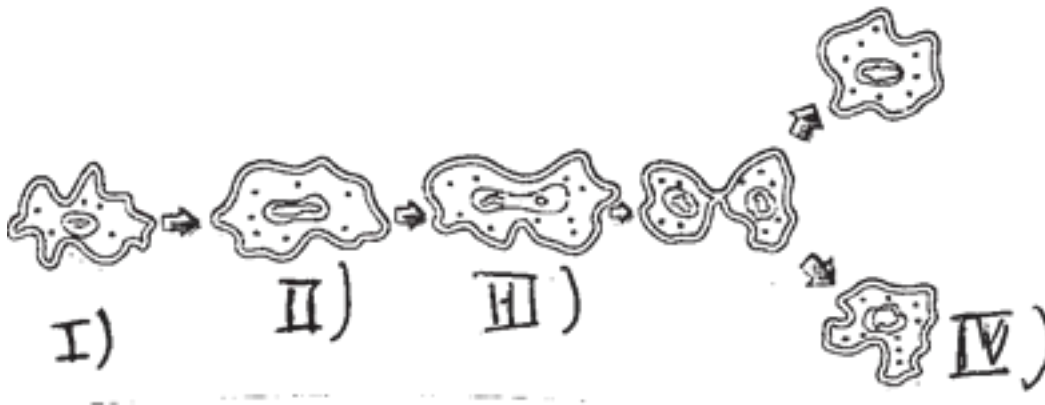


- 1) In Hydra, a bud develops as an outgrowth due to repeated cell division at a specific site.
- 2) These buds develop into tiny individuals and when fully mature, detach from the parent body and become a new independent individual.

OR

Binary fission in Amoeba:

It is a mode of asexual reproduction in which one cell divides into two daughter cells from a parent cell.



I) Parent cell (II) parent cell with constricted nucleus.

II) two nuclei in parent cell showing cytoplasmic constriction (IV) two daughter cells

Note: Only two marks to be given if diagram without labelling of four steps

Four labels on the diagram OR described as below:

- 1) The nucleus elongates and divides into two nuclei.
- 2) A constriction then appears on the cell membrane, which gradually increases inwards and divides the cytoplasm into two parts.
- 3) Finally, the two daughter cells are formed
- 4) Each daughter amoeba develops into an adult organism.

SECTION B

26. To find the focal length of a concave mirror, Sita should choose which one of the following set-ups?

(A) A mirror holder and a screen holder

- (B) A screen holder and a scale
- (C) A mirror holder, a screen holder and a scale
- (D) A screen, a mirror, holders for them and a scale

Ans. (D)

27. By using a convex lens, a student obtained a sharp image of his class-room window grill on a screen. In which direction should he move the lens to "focus a distant tree instead of the grill?

- (A) Towards the screen.
- (B) Away from the screen.
- (C) Very far away from the screen.
- (D) Behind the screen.

Ans. (A)

28. To determine the focal length of a convex lens by obtaining a sharp image of a distant object, the following steps were suggested which are not in proper sequence:

- I. Hold the lens between the object and the screen.
- II. Adjust the position of the lens to form a sharp image. Select a suitable distant object.
- III. Image. Select a suitable distance object.
- IV. Measure the distance between the lens and the screen.

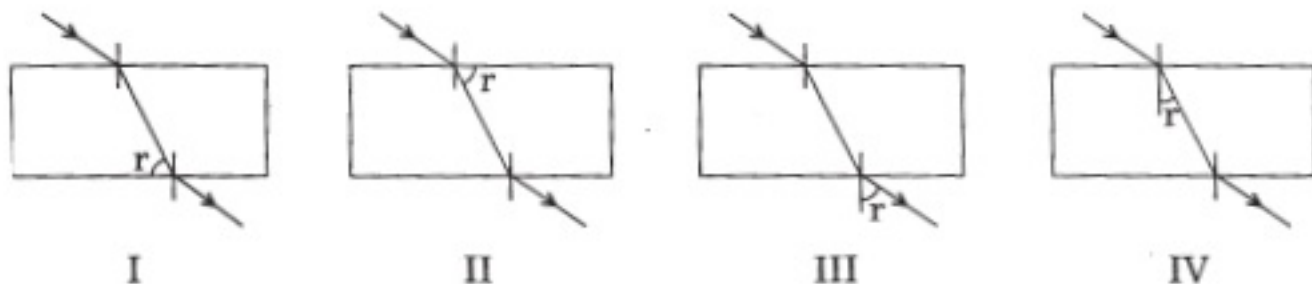
The correct sequence of steps to determine the focal length of the lens is —

- (A) III, I, II, IV
- (C) III, IV, II, I
- (B) III, I, IV, II

(D) I, II, OI, IV

Ans. (A)

29. In these diagrams, the angle of refraction r has been correctly marked in which diagram?



(A) I

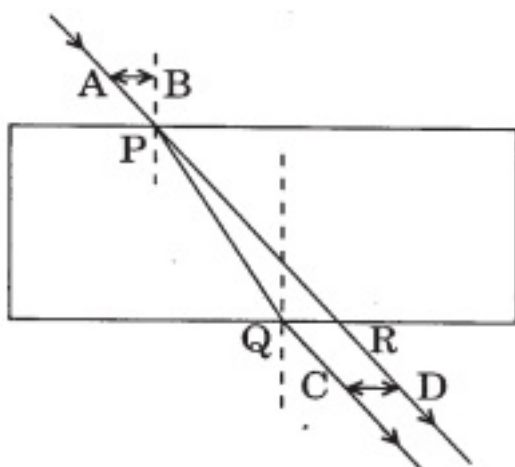
(B) II

(C) III

(D) IV

Ans. (A)

30. For a ray of light through a glass slab



The lateral displacement was correctly measured as

(A) AB

(B) PQ

(C) CD

(D) PR

Ans. (C) / if the candidate writes 'none of these' 1 mark to be awarded

31. Iron nails were dipped in an aqueous solution of copper sulphate. After about 30 minutes, it was observed that the colour of the solution changed from

(A) colourless to light green.

(B) blue to light green.

(C) blue to colourless.

(D) green to blue.

Ans. (B)

32. A cleaned aluminium foil was placed in an aqueous solution of zinc sulphate. When the aluminium foil was taken out of the zinc sulphate solution after 15 minutes, its surface was found to be coated with a silvery grey deposit. From the above observation it can be concluded that

(A) aluminium is more reactive than zinc.

(B) zinc is more reactive than aluminium.

(C) zinc and aluminium both are equally reactive.

(D) zinc and aluminium both are non-reactive.

Ans. (A)

33. Vapours of acetic acid smell

(A) pungent like vinegar.

(B) sweet like rose.

(C) suffocating like sulphur dioxide.

(D) odourless like water.

Ans. (A)

34. Acetic acid reacts with solid sodium hydrogen carbonate

(A) slowly forming no gas.

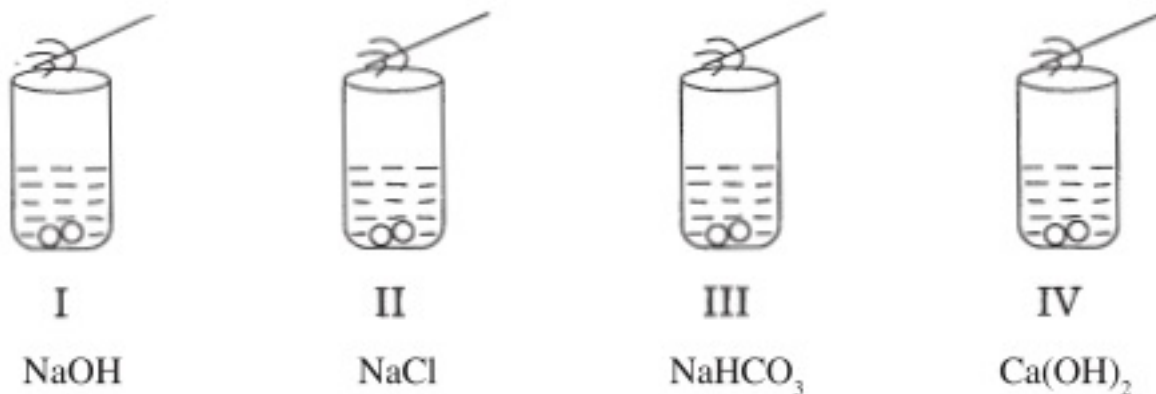
(B) vigorously with effervescence.

(C) slowly without effervescence.

(D) vigorously without gas formation.

Ans. (B)

35 A student added acetic acid to test tubes I, II, III and IV containing the labelled substances and then brought a burning splinter near the mouth of each test tube.



The splinter would be extinguished when brought near the mouth of test tube

(A) I

(B) II

(C) III

(D) IV

Ans. (C)

36. The shape of yeast cell is

(A) only spherical.

(B) only oval.

(C) irregular.

(D) both oval and spherical.

Ans. (B)

37. The steps involved in observing a slide under a microscope are given below. They may not be in proper sequence.

I. Focus the object under high power of the microscope.

II. Place the slide on the stage of the microscope.

III. Arrange the mirror to reflect maximum light to the slide.

IV. Focus the object under low power of the microscope.

The proper sequence of steps is

(A) II, III, IV, I

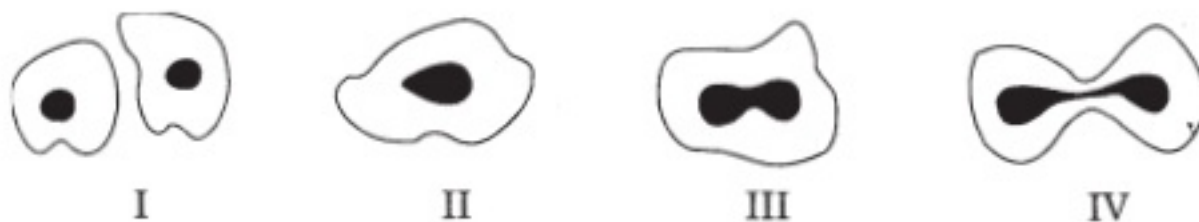
(B) I, II, III, IV

(C) IV, III, II, I

(D) III, I, II, IV

Ans. (A)

38. The given figures illustrate binary fission in Amoeba in improper order.



The correct order is

(A) III, IV, II, I

(B) IV, III, II, I

(C) II, III, IV, I

(D) I, III, IV, II

Ans. (C)

39. During the course of an experiment, 'to determine the percentage of water absorbed by raisins', raisins are weighed

(A) every half an hour.

(B) every hour.

(C) once - only after completing the experiment.

(D) two times - before soaking and after soaking for three hours.

Ans. (D)

40. The colour of raisins as used in the experiment, 'to determine the percentage of water absorbed by raisins' was

(A) white

(B) yellow

(C) dark brown

(D) pink

Ans. (C)

41. Following are the steps involved in the experiment' to determine the percentage of water absorbed by raisins'. They may not be in proper sequence.

I. Soak the raisins in fresh water.

II. Weigh dry raisins.

III. Weigh soaked raisins.

IV. Wipe out soaked raisins. The correct sequence of steps is

(A) I, II, III, IV

(B) II, I, IV, HI

(C) II, I, III, IV

(D) I, II, IV, III

Ans. (B)