

SUMMATIVE ASSESSMENT - II (2015-16) 4K6MST3

SCIENCE/विज्ञान Class - X

CPS SPJ

Time allowed : 3 hours

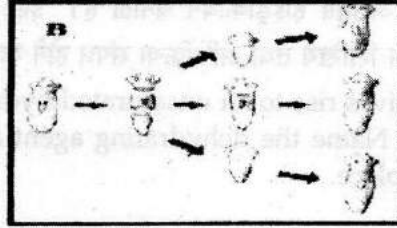
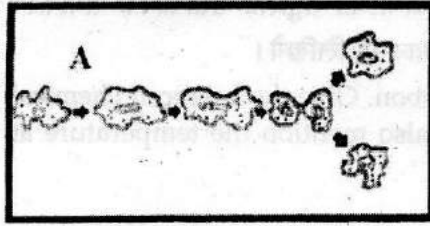
Maximum Marks : 90

भाग-अ / SECTION-A

- 1 The formula of citric acid is shown below : 1
- $$\begin{array}{c} \text{COOH} \\ | \\ \text{CH}_2 \\ | \\ \text{H}_3\text{C}-\text{C}-\text{COOH} \\ | \\ \text{CH}_2 \\ | \\ \text{COOH} \end{array}$$

State the name of $-\text{COOH}$ functional group in citric acid.
- 2 Name the type of reproduction mostly seen in unicellular organisms. 1
- 3 Name the state in which Indira Gandhi Canal has brought greenery. 1
- 4 Find the refractive index of glass with respect to water where refractive index of glass with respect to air is $n_{wa} = \frac{3}{2}$ and that of water with respect to air is $n_{wa} = \frac{4}{3}$. 2
- 5 Give two reasons why do we need to use our resource judiciously. 2
- 6 Name a physical quantity which circulates through the ecosystem. Mention its direction in an ecosystem in terms of trophic levels. Which trophic level will possess largest amount of this quantity ? 2
- 7 The general formula of the three compounds A, B and C is C_nH_{2n} . B has highest boiling point and C has lowest boiling point. 3
- (i) Mention the type of compound A, B and C.
 - (ii) Which of these has the minimum number of carbon atoms ?
 - (iii) Name the homologous series to which A, B and C belong.
- 8 State three reasons for placing chlorine and bromine in the same group of periodic table. 3
- 9 Dehydration of ethanol gives rise to an unsaturated hydrocarbon. Give the balanced chemical equation of the reaction. Name the dehydrating agent and also mention the temperature at which the reaction takes place. 3
- 10 The atomic number of S and Cl is 16 and 17 respectively and they belong to the same period. 3
- (a) Which one would have smaller atomic size ?
 - (b) Which one would be more electronegative ?
 - (c) To which group would each one belong ?
- 11 Explain with the help of a figure that father is responsible for the sex of a child. 3
- 12 DNA content has the tendency to double itself during sexual reproduction due to combining of the genetic materials from two parents. How can the problem of DNA doubling be solved to maintain the consistency of the genetic material throughout the species ? 3
- 13 An organ like a wing in birds are an advantage to the organism. Did they appear in different stages or were formed due to a single sudden change in them ? 3

14 Study the diagrams given below and answer the questions that follow. 3



- (a) Identify the processes shown above.
- (b) Name the organisms which use the above processes.
- (c) Give one distinguishing feature for both these organisms.

15 Chimpanzees, gorillas and humans are closely related. On what basis do we come to know that they are closely related? 3

3

- 16 (a) Mention value for the following : 3
 - (i) Range of vision for normal eye
 - (ii) Far point for normal eye
 - (iii) near point for normal eye
- (b) Answer the following :
 - (i) Part of human eye which helps to change focal length of eye lens.
 - (ii) The part of human eye where image of an object is formed.
 - (iii) The ability of eye lens to adjust its focal length.

- 17 (a) Write two rules of the new Cartesian sign conventions for spherical mirrors. 3
- (b) Trace the path of the reflected ray by drawing a ray diagram when the incident passes from centre of curvature of a concave mirror.

18 The ozone layer is a protective layer which absorbs the UV rays coming from the sun. In past few decades various human activities have led to thinning and formation of hole in the ozone layer. After knowing this you have tried to convince your family members and friends to minimise use of such substances. 3

- (a) Mention any two items used in the house which lead to depletion of the ozone layer.
- (b) Mention any two steps we should take to reduce the depletion of Ozone Layer.
- (c) What inspired you to take this step?

19 Name the element which has 5

- (a) The electronic configuration. 2, 8, 1.
- (b) A total of two shells, with 4 electrons in the valence shell.
- (c) A total of three shells, with 3 electrons in the valence shell.
- (d) One shell which is completely filled with electrons.
- (e) Twice as many electrons in the second shell as in the first shell.

20 (a) Why do we say that homozygous plants produce pure progeny? 5

- (b) Define heterozygous.
- (c) Explain how the process of speciation takes place.

21 Explain what happens when : 5

- (a) Testosterone is released in males.
- (b) Pollen grain falls on the stigma of the flower.
- (c) Egg fuses with sperm cell.
- (d) Planaria is cut into many pieces.
- (e) Buds are formed on the notches of the Bryophyllum leaf.

- 22 (a) Name the part of eye which has large number of light-sensitive cells. Write the function of these cells. 5
- (b) A person enters into a dark corridor from a brightly lit room.
- (i) State the effect on the pupil of the eye.
- (ii) How does this affect the amount of light entering the eye?
- (c) Which defect of vision is corrected by using bifocal lenses? What are the positions of concave lens and convex lens in a bifocal lens and why?

23 An object is situated at 10 cm from the convex lens of focal length 10 cm. Find the position and nature of the image. Draw ray diagram to show the formation of image (not to scale). 5

- 24 (a) Describe atmospheric refraction. Explain with the help of diagram why the sun is visible to us two minutes before the actual sun-rise and two minutes even after the sunset. 5
- (b) How will you use two identical glass prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as a beam of white light? Draw a labelled diagram to illustrate it.

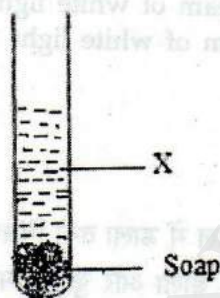
SECTION - B

25 While preparing soap in the laboratory, Sonia added "X" to vegetable oil and stirred the mixture. She observed that the test tube became hot, then she added sodium chloride and after sometime "Y" settled at the bottom of test tube. 1

The substances "X" and "Y" are :

- (a) Sodium carbonate and soap (c) Sodium carbonate and soap
- (b) Sodium hydroxide and glycerol (d) Sodium hydroxide and soap

26 Ritu performed saponification reaction and after the reaction was complete, her test tube appeared as shown in the following figure : 1



Substance "X" is :

- (a) Glucose (b) Glycol
- (c) Glycerol (d) Gelatin

27 During the experiment of cleansing action of soap in soft and hard water, a student observes that soap forms foam easily in soft water but not in hard water. He concludes that hard water 1

(a) reduces cleansing power and foaming capacity of soap.

(b) reduces cleansing power of soap but its foaming capacity remains unchanged.

(c) does not reduce cleansing power but reduces foaming capacity.

(d) neither reduces cleansing power nor foaming capacity of soap.

28 While performing an experiment to determine the focal length of a convex lens, a student obtains a sharp inverted image of the laboratory window grill on the screen and measures the distance 'd' between the screen and the lens. She then repeats the experiment and takes a distant tree as the object in the second case. In order to get a sharp image on the screen, she will now need to move the screen. 1

- (a) slightly nearer to the lens. (c) very close to the lens.
- (b) slightly farther away from the lens. (d) very far away from the lens.

29 If we focus concave mirror to reflect sunlight towards a point on a paper such that the paper can burn, this point will be at : (a) Focus (b) F/2 (c) C (d) pole 1

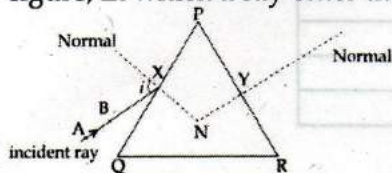
- 30 A student recorded the following sets of observations while performing an experiment "To trace the path of a ray of light passing through a rectangular glass slab for different angles of incidence". 1

S. No	Angle of incidence ($\angle i$)	Angle of refraction ($\angle r$)	Angle of emergence ($\angle e$)
I	41°	45°	41°
II	40°	38°	38°
III	45°	41°	40°
IV	45°	41°	45°

The correct observation is recorded at S. No. :

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

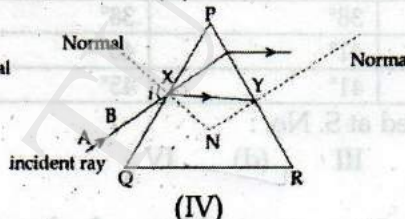
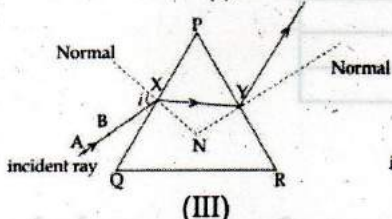
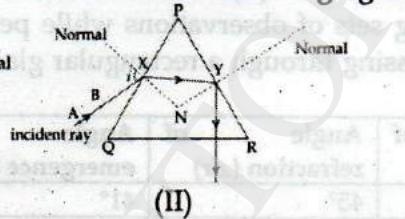
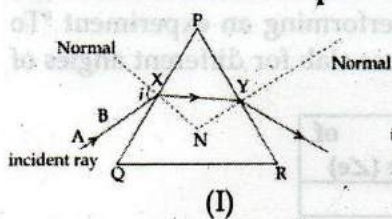
- 31 Four students were asked to trace the path of light through a glass prism shown below in the figure, in which a ray enters through face PQ. 1



Who has traced the correct path ?

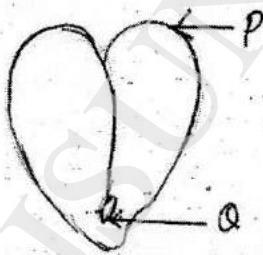
- (a) (I) (b) (II)
(c) (III) (d) (IV)

The students traced the path as shown in the following figures :



- 32 Identify which of the following is an analogous organ of thorn. 1
(a) tendril (b) spine (c) flower (d) leaf

- 33 Identify the appropriate labelling of the parts marked P and Q in the adjoining figure. 1



- (a) P - cotyledon ; Q - radicle
(b) P - plumule ; Q - cotyledon
(c) P - Seed coat ; Q - radicle
(d) P - Seed coat ; Q micropyle

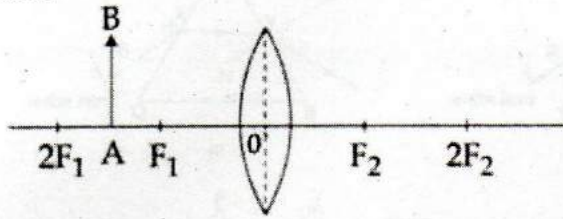
- 34 Fill in the blanks with appropriate words. 2

- (a) Acetic acid turns Blue litmus solution or paper into red.
(b) Acetic acid is miscible in water in all proportions and form clear solutions.

- 35 Mention the observations of budding in yeast. 2

36

Observe the following figure where an object is placed between F_1 and $2F_1$ in front of a convex lens.



2

After refraction of light rays the image will be formed. Write the nature, position and relative size of the image in the above case.