Science Sample Paper 3

Paper: X Science SA II Sample Paper 1

Total marks of the paper: 90

Total time of the paper: 3.5 hrs

General Instructions:

1. The question paper comprises of two sections, A and B you are to attempt both the sections.

2. All questions are compulsory.

3. 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.

4. All questions to section A and all questions of section B are to be attempted separately.

5. Question numbers 1 to 3 in section A are 1 mark questions. These are to be answered in one word or one sentence.

6. Question numbers 4 to 7 are two mark questions, to be answered in about 30 words.

7. Question number 8 to 19 is three mark questions, to be answered in about 50 words.

8. Question number 20 to 24 are five mark questions, to be answered in about 70 words.

9. Question numbers 25 to 42 in section B are multiple choice questions based on practical skills. Each question is a one mark question. You are choosing one most appropriate response out of the four provided to you.

Questions:

1]

Why carbon forms strong bonds with other carbon atoms, hydrogen, oxygen, nitrogen or sulphur?   [Marks:1]

2]

List any two functions of food chain in an ecosystem.   [Marks:1]

3]

Name the part of eye responsible for conversion of light into electrical impulses.   [Marks:1]

4]

Write one property of hydrogen which makes it resemble with (a) Alkali metals (b) Halogens.   [Marks:2]

5]

(a) Define watershed management.

(b) What are the advantages of watershed management?   [Marks:2]

6]

(a) Where is copper-T placed?

(b) What will happen if the vas deferens in the male is blocked surgically?   [Marks:2]

7]

(a) What is vegetative propagation?

[Marks:2]

(b) Name the male and female reproductive part of a flower.

8]

a. How does valency vary in a group on going from top to bottom?

[Marks:3]

b. How does the number of valence electrons vary in a period on going from left to right and from top to bottom in a group?

9]

A concave lens has focal length of 25 cm. At what distance should the object from the lens be placed so that if it forms an image at 20 cm distance from the lens? Also find the magnification produced by the lens.

[Marks:3]

10]

Give an explanation for the formation of a rainbow.

[Marks:3]

11]

(a) How are we able to see distant and nearby objects clearly?

(b) Which part of eye helps in changing the curvature of lens?

[Marks:3]

(c) What is a blind spot?

12]

How do you find the rough focal length of a convex lens? Is the same method applicable to a concave lens?

[Marks:3]

13]

On reaction with sodium hydroxide, X yielded ethanoic acid and ethanol.

(a) Give the IUPAC name of X?

[Marks:3]

(b) Name the reaction.

(c) Give a chemical reaction for the above reaction.

14]

(a) How is the electronic configuration of an element related to its position in the modern periodic table? Give one example.

[Marks:3]

(b) Why is nitrogen more electronegative than phosphorus?

15] We hear and read about female foeticide, which is really a wrong practice. In some families, be it rural or urban, females are tortured for giving birth to a girl child. They do not seem to understand the scientific reason behind the birth of a boy or a girl. In your opinion, the approach of the society towards mother in this regard is correct or not? Explain the scientific reason.

[Marks:3]

16]

(a) If a purple flowered pea plant (PP) is crossed with a white flowered pea plant (pp), will we have white flowered pea plant in F_1 generation? Why or why not?

[Marks:3]

(b) What do you mean by dominant and recessive trait?

17]

Define the following terms:

      i) Genetic drift

      ii) Heredity

      iii) Analogous organs

[Marks:3]

18]

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

[Marks:3]

19]

Explain why

      (a) Scrotum remains outside the body of human males.

      (b) Petals of flowers are variously coloured.

      (c) Some plants are propagated only by vegetative methods.

[Marks:3]

20]

(a) Why magnification is taken negative for real images and positive for virtual images?

(b) Why a convex mirror is used as rear-view mirror in vehicles?

(c) Power of convex lens is 4.5 D. Find its focal length.

OR

(a) Find the size, nature and position of image formed when an object of size 1 cm is placed at a distance of 15 cm from a concave mirror of focal length 10 cm.

(b) Why does light travel faster in water in comparison to kerosene? (Refractive index of water and kerosene are 1.33 and 1.44 respectively)

[Marks:5]

21]

(i) Define:

(a) Centre of curvature of a spherical mirror

(b) Pole of a spherical mirror

(ii) State the mirror formula and its magnification.

(iii) Using same find the distance at which an object should be placed for getting a real and inverted image at 45 cm using a concave mirror of focal length 20 cm.

OR

(i) A concave lens has focal length of 20 cm. At what distance from the lens should a 5 cm tall object be placed so that it forms an image at 15 cm from the lens? Also calculate the size of the image formed.

[Marks:5]

(ii) A ray of light passing through centre of curvature of a spherical mirror retraces its path on reflection from the mirror. Why?

22]

(a) What is genetics?

(b) Give the common name of the plant on which Mendel performed his experiments.

(c) For what did Mendel used the term factor and what are these factors called now?

[Marks:5]

(d) What are genes? Where are genes located?

OR

(a) What is Natural Selection? Explain.

(b) Why are thorn of Bougainvillea plant and a tendril of Passiflora plant considered homologous organs?

23]

(a) What is placenta? Discuss two functions of placenta.

(b) Give two examples each of:

    i) Sexually transmitted bacterial infections

    ii) Sexually transmitted viral infections

[Marks:5]

OR

(a) Draw a neat labelled diagram of longitudinal section of flower.

(b) Write two points of difference between self and cross-pollination.

24]

(a) Which property of carbon leads to formation of large number of compounds? Define it?

(b) What is the functional group in the following molecules?

i. $CH_3CH_2CH_2OH$

[Marks:5]

ii. $CH_3-\overset{\overset{\displaystyle O}{\|}}{C}-OH$

(c) Which of the following formula represents a saturated hydrocarbon?

C_nH_{2n} , C_nH_{2n+1} , C_nH_{2n+2} , C_nH_{2n-2}

(d) What happens when methane is burnt in oxygen?

(e) Why is the conversion of ethanol to ethanoic acid an oxidation reaction?

OR

(a) Give three points to distinguish between alkenes and alkynes.

(b) Explain the mechanism of cleaning action of detergents.

25] On reacting $NaHCO_3$ and acetic acid, the gas evolved turns: [Marks:1]

A. Lime water milky

B. Water milky

C. Kerosene oil milky

D. Acidified $K_2Cr_2O_7$ solution milky

26] Which of the following compound can turn blue litmus solution red? [Marks:1]

A. NaOH

B. CH_3CHO

C. CH_3OCH_3

D. CH_3COOH

27] The reaction between ethanoic acid with $NaHCO_3$: [Marks:1]

A. Is very slow

B. Is vigorous and produce a lot of effervescence

C. Gives pungent smell

D. Gives out gas which burns with a pop sound.

28] In a yeast cell, during budding there can be [Marks:1]

A. Single bud

B. Two buds

C. Three buds

D. Chain of buds

29]
Binary fission starts in an amoeba with the: [Marks:1]

A. Constriction of its cell membrane

B. Elongation of its nucleus

C. Two amoebae come closer

D. Both (b) and (c)

30]
A sharp image of distant object is obtained on a screen by using convex lens. In order to determine the focal length of the lens you need to measure the distance between the: [Marks:1]
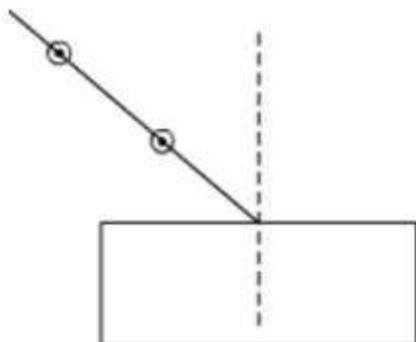
A. Lens and the object

B. Lens and the screen

C. Object and the screen

D. Lens and the screen and also object and the screen.

31]
Select from the following the best set-up for tracing the path of a ray of light through a rectangular glass slab:
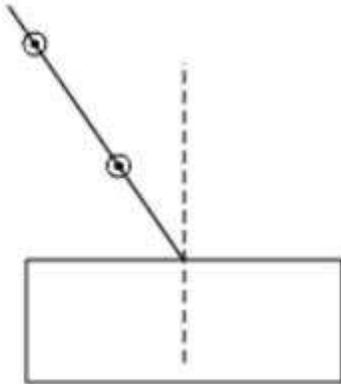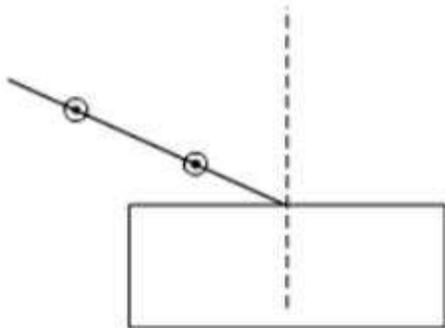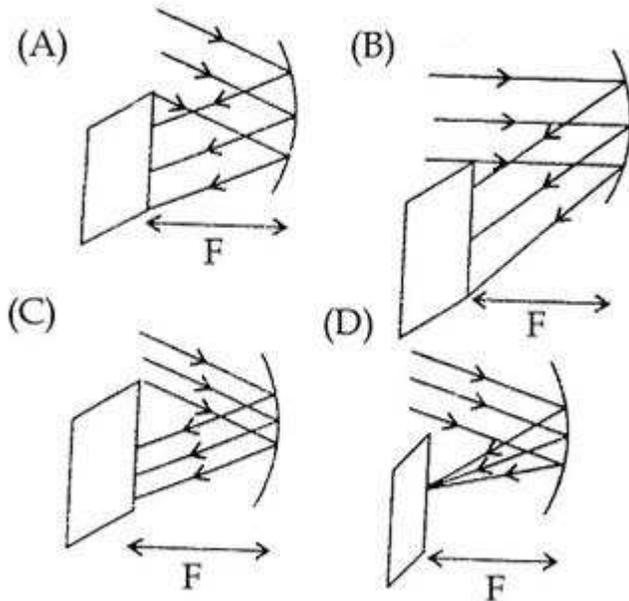
(i)

[Marks:1]

(ii)
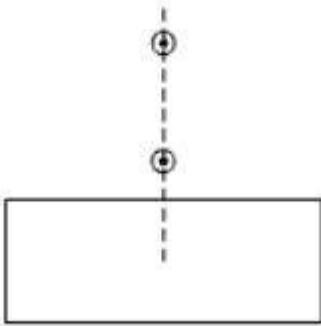
(iii)

(iv)

A.   I

B.   II

C.   III

D. IV

32]

The image formation, when rays from a distance object fall on a concave mirror is correctly depicted in the ray diagram:

[Marks:1]

A. A

B. B

C. C

D. D

33]

A student soaked 12 g of raisins in 60 mL of distilled water in two beakers A and B each. She maintained beaker A at 20^0C and beaker B at 40^0C after an hour. The percentage of water absorbed will be: [Marks:1]

A. The same in both A and B

B. More in A than in B

C. More in B than in A

D. Exactly twice as much as in B as in A

34]

Raisins absorb water by

[Marks:1]

A. Exosmosis

B. Endosmosis

C. Plasmolysis

D. Diffusion

35]

The water absorbed by raisins is calculated as

[Marks:1]

A. Weight of wet raisins-weight of dry raisins.

B. Weight of dry raisins-weight of wet raisins.

C. Weight of water in Petridis-weight of wet raisin.

D. Weight of dry raisins+weight of wet raisins.

36]

A blue litmus paper was first dipped in dilute HCl and then in diluteNaOH solution. It was observed that the colour of litmus paper:

[Marks:1]

A. Changed first to red then to colourless

B. Changed first to red then to blue

C. Changed blue to colourless

D. Remained blue in both solutions.

37]

When the ray light is going from denser to rarer medium, the angle of refraction is always:

[Marks:1]

A. Smaller than the angle of incidence

B. Equal to the angle of incidence

C. Greater than the angle of incidence

D. Can be any depending upon the
material of the denser medium

38]
If a glass rod is immersed in a liquid of the same refractive index, it will [Marks:1]

A. appear to be longer

B. appear to be shorter

C. appear to be thicker

D. disappear

39]
A colourless and odourless gas is liberated when hydrochloric acid is added to a [Marks:1]
solution of washing soda. The name of the gas is :

A. Carbon dioxide

B. Nitrogen dioxide

C. Sulphur dioxide

D. Sulphur trioxide

40]
The process which is used to prepare soap is known as [Marks:1]

A. Saponification

B. Hydrolysis

C. Combustion

D. Decomposition

41]
Monika has to determine the focal length of a concave mirror and a convex lens
of focal length about 15 cm each. She uses a distant tree as the object and
obtains the sharp image of the tree, one by one on a screen. The distances l_1 and [Marks:1]
l_2 between the mirror/lens and the screen in the two cases and the nature of
their respective images obtained on the screen are likely to be

A. (30 cm, 15 cm) and (erect,
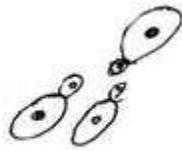inverted)

B. (15 cm, 15 cm) and (inverted,

inverted)

C. (15 cm, 30 cm) and (inverted, erect)

D. (30 cm, 30 cm) and (inverted, inverted)

42]

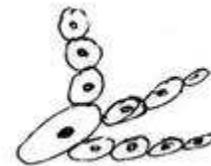The diagram which does not illustrate budding in yeast is

(A)   (B)   (C)   (D)

[Marks:1]

A. A

B. B

C. C

D. D