PRERNA EDUCATION

SAMPLE PAPER (2019)

Science

Class-X

Time: 3 hours **Max. Marks: 80**

General Instructions :

(i) All questions are compulsory.

(ii) This question paper consists of 30 questions divided into four Sections – A, B, C and D.

(iii) Section A contains 6 questions of 1 mark each. Section B contains 6 questions of 2 marks each, Section C contains 10 questions of 3 marks each. Section D contains 8 questions of 4 marks each.

(iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and 3 questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.

(v) Use of calculators is not permitted.

SECTION-A

1. Give an example of reaction catalysed by an enzyme.
2. Which spherical mirror does always produce a virtual, erect and diminished image of an object?
3. Name two main abiotic factors, which affect human environment.
4. How does the electronic configuration of an atom relate to its position in the modern periodic table?
5. "Genes and chromosomes have similar behaviour" Justify.
6. When two lenses of focal length +10 cm and –5 cm are placed in contact, then find the net power.

SECTION-B

7. Draw a schematic diagram to explain the independent inheritance of two separate traits, shape and color of seeds.
8. An object is kept in front of a concave mirror of focal length 15 cm. The image formed is three times the size of object. Calculate two possible distances of the object from the mirror.
9. Draw a ray diagram to show the image of an object placed between f and 2 f of a thin convex lens. Deduce the relation between the object and image distance and focal length.
10. Where should an object be placed from a converging lens of focal length 20 cm, so as to obtain a real image of magnification 2?
11. Explain the role played by:

    (a) iris (b) pupil (c) cornea (d) retina
12. "Economic growth and ecological conservation should go hand in hand." Explain why?

SECTION-C

13. (a) Name element of group 2 belonging to 3^{rd} and 4^{th} period.

    (b) Name the element having highest ionization energy in periodic table.

(c) Draw electron dot structure of:

(i) H_2O (ii) CH_4 (iii) NH_3 (iv) BF_3

(d) Differentiate between ores and minerals.

Or

(a) Write the name and symbol of group 17 element belonging to second period.

(b) Write electronic configuration of K(19). To which group of periodic table does it belong?

(c) What are substitution reactions? Give one example.

(d) What happens when acetic acid reacts with sodium bicarbonate? Give chemical reaction involved.

(e) Why does carbon form covalent bonds?

14. (a) Write the name and molecular formula of an organic compound having its name suffixed with –ol and having two carbon atoms in the molecule. With the help of a balanced chemical equation indicate what happens when it is heated with excess of conc. H_2SO_4?

(b) What is substitution reaction? Give an example.

Or

(a) With the help of an equation, state what happens when Ethanoic acid reacts with a base?

(b) Why are coal and petroleum called fossil fuels?

(c) What type of fuels (i) burn without a flame and (ii) burn with a flame?

(d) Why is conversion of ethanol to ethanoic acid on oxidation reaction?

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

Or

Give salient features of Darwin's theory of natural selection.

16. How the blood groups are inherited in humans?

Or

(a) Give three important features of fossils with the help in study of evolution.

(b) How does taxonomy support the evolution?

17. Draw ray diagram to show the formation of a three times magnified (i) real image, (ii) virtual image of an object kept in front of a converging lens. Mark the position of object F, 2F, O and position of image clearly in the diagram.

An object of size 5 cm is kept at a distance of 25 cm from the optical centre of converging lens of focal length 10 cm. Calculate the distance of the image from the lens and size of the image.

Or

(a) How can you distinguish between a plane mirror, a convex mirror and a concave mirror, just by looking at the image formed by them.

(b) The lens prescribed by the doctor has a power equal to +2.0 D. What does it mean?

(c) What would be the approximate focal length of a spherical lens preferred to use while reading small letters found in a dictionary?

18. (a) The human eye focuses object at different distance by adjusting the focal length of the eye lens. Name this phenomenon.

(b) Draw the human eye diagram and label the following parts:

(i) iris, (ii) pupil, (iii) ciliary muscles.

(c) What are the role played by them in the working of eye?

(d) In which part of the eye electrical signal are generated and why?

Or

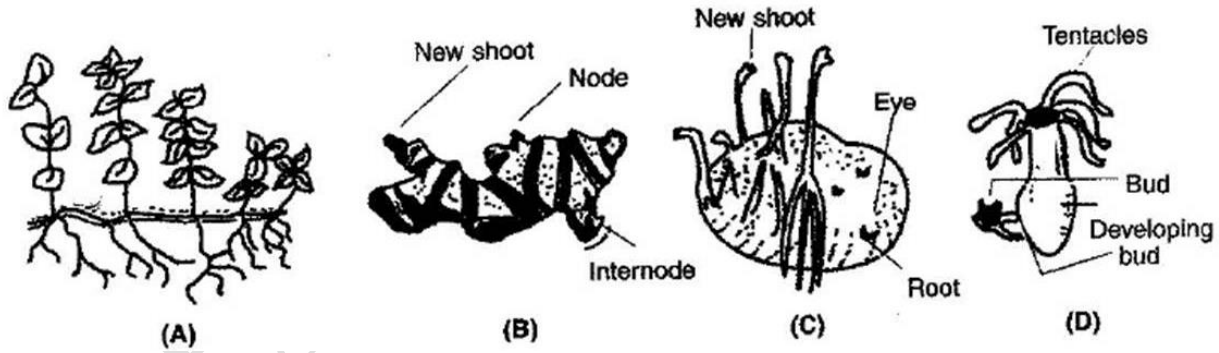
What is refraction? Write the basic laws of refraction. What happens to the frequency, velocity and wavelength as light moves from one medium to another? Based on the bending in refraction, how can you identify the nature of the medium?

19. (a) Acetic acid, when dissolved in water, it disassociates into ions reversely. Why?

(b) Give the reaction involved.

20. (a) Which is not a vegetative propagation in the following answer?

(b) Give the reason for your answer.



21. When light from free space bends towards normal, on hitting a surface, then what should be its refractive index (μ) ? Is it $\mu > 1$, $\mu < 1$ or $\mu = 1/2$? Justify your answer.

22. An object 320 cm high is placed perpendicular to the principal axis of a concave lens of length 7.5 cm. The image s formed at a distance of 5.0 cm from the lens. Calculate (i) distance at which object is placed, and (ii) size and nature of image formed.

23. Draw a ray diagram to show the position and nature of the image formed when an object is placed between focus F and pole P of a concave mirror .

24. What is long sightedness ? List two causes for development of long-sightedness. Describe with a ray diagram, how this defect may be corrected by using spectacles.

25. A metal does not corrode when left exposed to air. It also occurs in nature in its oxide form and is used in thermite reaction.
    a. Identify the metal.
    b. Describe the method used to enrich chief ore of this metal.
    c. Give two balanced chemical reactions in which this metal acts as a reducing agent.

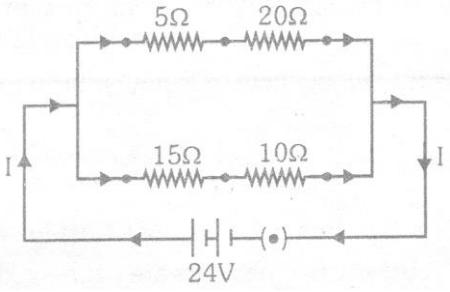
26. (a) Why do all the elements of the same group have similar properties ?
    (b) How will the tendency to gain electrons change as we go from left to right across a period ? Why ?

27. (a) What is meant by saying that potential difference between two points is 1 volt ? Name a device that helps to measure the potential difference a conductor.
    (b) Why does the connection cord of an electric heater not glow hot while the heating element does ?
    (c) Electrical resistivity's of some substances at 20^0C are given below :

Silver	$1.60 \times 10^{-8}\ \Omega$ m
Copper	$1.62 \times 10^{-8}\ \Omega$ m
Tungsten	$5.20 \times 10^{-8}\ \Omega$ m
Iron	$10.0 \times 10^{-8}\ \Omega$ m
Mercury	$94.0 \times 10^{-8}\ \Omega$ m
Nichrome	$100 \times 10^{-6}\ \Omega$ m

    Answer the following questions in relation to them :
    (i) Among silver and copper, which one is better conductor ? Why ?
    (ii) Which material would you advise to be used in electrical heating devices ? Why ?

28. If a 12 V battery is connected to the arrangement of resistance given in Fig. (with 5Ω replaced by 10Ω , 15Ω replace by 5Ω and 10Ω replaced by 25Ω). Calculate (i) the total effective resistance of the arrangement and (ii) the total current flowing in the circuit .



29. What is the function of an earth wire ? Why is it necessary to earth metallic appliances ?

30. A current through a horizontal power line flows in east to west direction. What is the direction of magnetic field at a point directly below it and at a point directly above it ?