

CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-11

Time : 3 Hours

Maximum Marks : 80

General Instructions :

- (i) The question paper comprises of three sections-A, B and C. Attempt all the sections.
 - (ii) All questions are compulsory.
 - (iii) Internal choice is given in each sections.
 - (iv) All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
 - (v) All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50-60 words each.
 - (vi) All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80-90 words each.
 - (vii) This question paper consists of a total of 30 questions.
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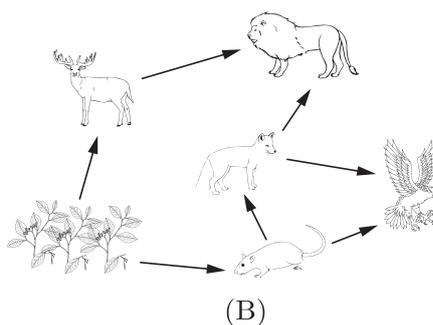
SECTION A

Q1. Name the colour of light for which the angular deviation is (a) maximum (b) minimum. [1]

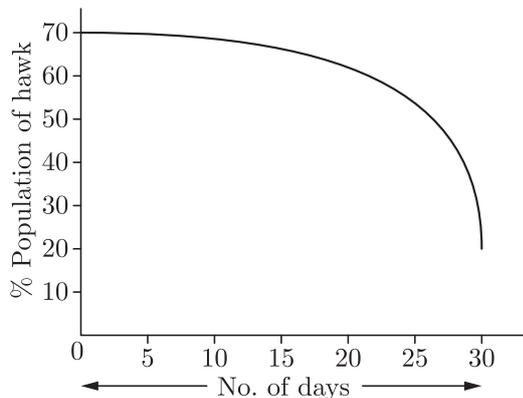
Q2. Why should management of natural resources ensure their equitable distribution? [1]

Q3. **Answer question numbers 3.1-3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**

An ecosystem that retains a high biodiversity is more likely to adapt to human-caused environmental changes than the one that shows low biodiversity. Consider the two food webs shown in the diagrams A and B.



These food webs are highly simplified as compared to the food webs present in natural ecosystems but they still illustrate a key difference between more diverse and less diverse ecosystems. Food web A represents a situation with high biodiversity, which implies many more alternative feeding pathways while food web B represents a situation with low biodiversity, which means, only a single type of organism is available for other organisms.



- 3.1 Why does every food chain start with a producer? [1]
- 3.2 State the significance of food web for an ecosystem. [1]
- 3.3 Name an organism that acts as a prey as well as a predator in food web A. [1]
- 3.4 Based on the data represented in the graph, state what could be the reason for decrease in the population of hawks when considering the food web A and food web B. [1]

Q4. Question numbers 4.1-4.4 are based on the two tables given below and the related studied concepts. Study them and answer the questions that follow.

Table A: Blood Glucose Chart

Remarks	Mean Blood Glucose Level (mg/dL)
Doctor’s advice required	200 - 400
Good	100 - 140
Excellent	80 - 100

Table B: Blood report of Patient

Checking Time	Blood Sugar Range (mg/dL)
Fasting (before breakfast)	> 126
Just after eating	> 220
3 hours after eating	> 200

- 4.1 Refer Table B that shows the blood sugar level of a patient. Which disease can be diagnosed from the given data? [1]
- 4.2 Which hormone is responsible for the disease diagnosed? [1]
- 4.3 Which of the following glands secretes the hormone identified in (b)? [1]
 - (a) Thyroid gland
 - (b) Adrenal gland
 - (c) Pancreatic gland
 - (d) Parathyroid gland
- 4.4 What would be the diagnosis of a patient whose blood sugar level 120 mg/dL just after eating? [1]
 - (a) It is good.
 - (b) It is excellent.
 - (c) It is high.
 - (d) It is low.

- Q5. A solution turns pink when a drop of phenolphthalein is added to it. The pH value of this solution is likely to be [1]
 - (a) 3
 - (b) 5
 - (c) 7
 - (d) 10

OR

Which of the following will turn blue litmus to red?

- (a) Lime water (b) Human blood
(c) Milk of magnesia (d) Lime juice

- Q6. To focus the image of a nearby object on the retina of the eye, [1]
(a) the curvature of the eye lens is decreased.
(b) the focal length of the eye lens is increased.
(c) the thickness of the eye lens is increased.
(d) the thickness of the eye lens is decreased.
- Q7. A, B and C are three elements with atomic numbers 9, 10 and 11 respectively. Identify the group to which the elements A and C belong. [1]
(a) Inert gas, halogen (b) Halogen, inert gas
(c) Halogen, alkali metal (d) Inert gas, alkali metal
- Q8. Tungsten is used almost exclusively for filaments of electric bulbs because [1]
(a) its resistivity is high and melting point is low.
(b) both the resistivity and the melting point are high.
(c) its resistivity is low and melting point is high.
(d) both the resistivity and the melting point are low.
- Q9. You have dil. sulphuric acid in a test tube. Which of the following aqueous solutions would you add to this test tube to get white precipitate? [1]
(a) NaCl solution (b) CuSO_4 solution
(c) Na_2SO_4 solution (d) BaCl_2 solution
- Q10. In torches, searchlights and headlights of vehicles the bulb is placed [1]
(a) between the pole and the focus of the reflector.
(b) at the centre of curvature of the reflector.
(c) between the focus and centre of curvature of the reflector.
(d) close to the focus of the reflector.

OR

The image of an object placed at infinity will be highly diminished and point sized in [1]

- (a) Concave mirror only
(b) Convex mirror and convex lens both
(c) Convex lens only
(d) Concave mirror and convex lens both
- Q11. A basic salt is formed by the neutralisation of a [1]
(a) strong acid with a strong base. (b) strong acid with a weak base.
(c) weak acid with a strong base. (d) weak acid with a weak base.
- Q12. An object is placed on the principal axis of a concave mirror of focal length 24 cm. If the image distance is 20 cm more than the object distance, the magnification of the image is [1]
(a) 1.2 (b) 1.5
(c) 2.4 (d) 4.8

OR

The refractive index of dens flint glass is 1.65 and for alcohol, it is 1.36 with respect to air, then the refractive index of the dens flint glass with respect to alcohol is [1]

- (a) 1.31 (b) 1.21
(c) 1.11 (d) 1.01

For question numbers 13 and 14, two statements are given—one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both A and R are true and R is correct explanation of the assertion.
(b) Both A and R are true but R is not the correct explanation of the assertion.
(c) A is true but R is false.
(d) A is false but R is true.

Q13. **Assertion :** Corrosion of iron is known as rusting.

Reason : Corrosion of iron takes place in the presence of both air and moisture. [1]

Q14. **Assertion :** A freely suspended magnet always rests in the geographical north-south direction.

Reason : The Earth behaves like a huge magnet with its north pole towards geographical south and south pole towards geographical north. [1]

SECTION B

Q15. Give the chemical name and formula of bleaching powder. What happens when it is exposed to air? List two uses of bleaching powder. [3]

Q16. You must have tasted or smelled food containing fat which has been left for a long time. Such food tastes and smells bad. Name the phenomenon responsible for this and state the reason. List two measures for its prevention. [3]

OR

A silver article generally turns black when kept in the open for a few days. The article when rubbed with toothpaste again starts shining.

- (a) Why do silver articles turn black when kept in the open for a few days? Name the phenomenon involved.
(b) Name the black substance formed and give its chemical formula. [3]

Q17. An element M with electronic configuration (2, 8, 2) combines separately with radicals, $(\text{NO}_3)^-$, $(\text{SO}_4)^{2-}$ and $(\text{PO}_4)^{3-}$. Write the formula of three compounds so formed. To which group and period of the Modern Periodic Table does the element M belong? Will M form covalent or ionic compounds? Give reason to justify your answer. [3]

Q18. How does chemical coordination occur in plants? [3]

Q19. What constitutes the central and peripheral nervous systems? How are the components of central nervous system protected? [3]

Q20. Give an example of characteristics that are used to determine how close two species are in evolutionary terms. [3]

OR

Explain how genes control the characteristics or traits of an organism. [3]

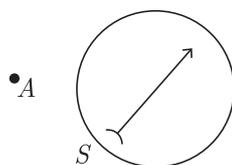
- Q21. To obtain an erect image of an object, using a concave mirror of focal length 15 cm, what should be the range of distance of the object from the mirror? What is the nature of the image? Is the image larger or smaller than the object? Draw a ray diagram to show the image formation in this case. [3]

OR

What are spherical lenses? What are two types of these lenses? Explain in brief the meanings of the following terms.

- (a) Principal axis
- (b) Optical centre
- (c) Aperture

- Q22. A magnetic compass needle is placed in the plane of paper near point A as shown in the given figure. In which plane should a straight current carrying conductor be placed so that it passes through A and there is no 'A change in the deflection of the compass? Under what condition is the deflection maximum and why? [3]



- Q23. What is the function of an earth wire? Why is it necessary to earth metallic appliances? [3]
- Q24. Explain the role of decomposers in the environment. [3]

SECTION C

- Q25. A non-metal A which is the largest constituent of air, when heated with H_2 in 1: 3 ratio in the presence of catalyst (Fe) gives a gas B. On heating with O_2 it gives an oxide C. If this oxide is passed into water in the presence of air it gives an acid D which acts as a strong oxidising agent.
- (a) Identify A, B, C and D.
 - (b) To which group and period of periodic table does this non-metal belong? [5]
- Q26. A compound C (molecular formula, $C_2H_4O_2$) reacts with Na-metal to form a compound R and evolves a gas which burns with a pop sound. Compound C on treatment with an alcohol A in presence of an acid forms a sweet smelling compound S (molecular formula, $C_3H_6O_2$). On addition NaOH to C, R and water are produced. S on treatment with NaOH solution gives back R and A. Identify C, R, A and S and write down the reactions involved. [5]

OR

Draw the structural formulae of all the possible isomers of the compound with the molecular formula C_3H_6O and also give their electron dot structures. [5]

- Q27. List in tabular form four differences between aerobic and anaerobic respiration. Name two organisms that use the anaerobic mode of respiration. [5]
- Q28. (a) How does fertilisation take place in human beings? 'Fertilisation occurs once in a month'. Comment.
- (b) What changes are observed in the uterus subsequent to implantation of young embryo? [5]

OR

- (a) Why is DNA copying an essential part of the process of reproduction? Write two advantages of

sexual reproduction over asexual reproduction.

- (b) What are chromosomes? Explain how in sexually reproducing organisms the number of chromosomes in the progeny is maintained. [5]

Q29. (a) Write the importance of ciliary muscles in the human eye. Name the defect of vision that arises due to gradual weakening of the ciliary muscles in old age. What type of lenses are required by the persons suffering from this defect to see the objects clearly?

- (b) A person needs a lens of power -5.5 dioptre for correcting his distant vision. For correcting his near vision he needs a lens of power $+1.5$ dioptre. What is the focal length of the lens required for correcting (i) distant vision, and (ii) near vision? [5]

Q30. (a) Derive an expression for the equivalent resistance of three resistors R_1 , R_2 and R_3 connected in series.

- (b) Fuse of 3 A, 5 A and 10 A are available. Calculate and select the fuse for operating electric iron of 1.32 kW power at 220 V line. [5]

OR

What is Joule's heating effect? How can it be demonstrated experimentally? List its four applications in daily life. [5]

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