

CLASS X (2019-20)
SCIENCE (CODE 086)
SAMPLE PAPER-6

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.
-

SECTION A

- Q1. Name the Physicist who discovered the magnetic effect of the electric current. [1]
- Q2. No two individuals are absolutely alike in a population. Why ? [1]
- Q3. **Answer question numbers 3.1–3.4 on the basis of your understanding of the following paragraph and the related studied concepts.**

The human eye is like a camera. Its lens system forms an image on a light-sensitive screen called the retina. Light enters the eye through a thin membrane called the cornea. It forms the transparent bulge on the front surface of the eyeball as shown in the figure. The crystalline lens merely provides the finer adjustment of focal length required to focus objects at different distances on the retina. We find a structure called iris behind the cornea. Iris is a dark muscular diaphragm that controls the size of the pupil. The pupil regulates and controls the amount of light entering the eye.

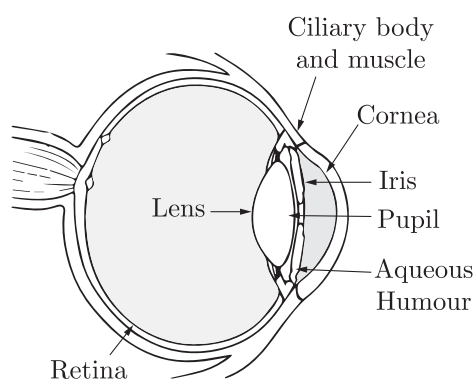


Fig: The Human Eye

There are mainly three common refractive defects of vision. These are (i) myopia or near-sightedness, (ii) hypermetropia or far-sightedness, and (iii) Presbyopia. These defects can be corrected by the use of suitable spherical lenses.

- 3.1** What is the function of pupil in the human eye? [1]

3.2 What is the far point and near point of human eye with normal vision? [1]

3.3 A student has difficulty reading the blackboard while sitting in the last row. What could be the defect the child is suffering from? [1]

3.4 What is the function of iris in human eye? [1]

Q4. Given table provides the resistivity of conductors, alloy and insulators. Study the table and answer the following questions.

	Material	Resistivity (Ω m)
Conductors	Silver	1.60×10^{-8}
	Copper	1.62×10^{-8}
	Aluminium	2.63×10^{-8}
	Tungsten	5.20×10^{-8}
	Nickel	6.84×10^{-8}
	Iron	10.0×10^{-8}
	Chromium	12.9×10^{-8}
	Mercury	94.0×10^{-8}
	Manganese	1.84×10^{-6}
Alloys	Constantan (alloy of Cu and Ni)	49×10^{-6}
	Manganin (alloy of Cu, Mn and Ni)	44×10^{-6}
	Nichrome (alloy of Ni, Cr, Mn, and Fe)	100×10^{-6}
Insulators	Glass	$10^{10} - 10^{14}$
	Hard rubber	$10^{13} - 10^{16}$
	Ebonite	$10^{15} - 10^{17}$
	Diamond	$10^{12} - 10^{13}$
	Paper (dry)	10^{12}

4.1 Why among iron is a better conductor than mercury? [1]

4.2 Which material is the best conductor? [1]

4.3 The copper and aluminium have [1]

- (a) Low resistivity (b) high resistivity
(c) zero resistivity (d) high energy losses

4.4 Alloys are commonly used in electrical heating devices due to [1]

- (a) Low resistivity as compare to all substance
(b) high resistivity as compare to metals
(c) Low resistivity as compare to metals
(d) None of these

Q5. 2 ampere current is flowing through a conductor from a 10 volt emf source then resistance of conductor is [1]

- (a) 20Ω (b) 5Ω
(c) 12Ω (d) 8Ω

OR

Three resistors of $4.0\ \Omega$, $6.0\ \Omega$ and $10.0\ \Omega$ are connected in series. What is their equivalent resistance [1]

- (a) $20\ \Omega$ (b) $7.3\ \Omega$
(c) $6.0\ \Omega$ (d) $4.0\ \Omega$

Q6. A student is to find the focal length of (i) a concave mirror (ii) convex lens by focussing the image of a distant object on a screen. He will observe that the screen is on the same side as that of the object in [1]

- (a) both cases
(b) case (i) but not in case (ii)
(c) case (ii) but not in case
(d) neither case (i) nor in case (ii)

Q7. A student takes some zinc granules in a test tube and adds dil. HCl to it. He would observe that the colour of zinc granules changes to : [1]

- (a) brown (b) black
(c) yellow (d) white

Q8. Crystals of CH_3COOH , when dissolved in water will form : [1]

- (a) weak acid (b) weak base
(c) strong acid (d) strong base

OR

The pH value of a solution is in the range of 6 to 8. What is the colour developed when a student adds three drops of universal indicator in the solution? [1]

- (a) Red (b) Blue
(c) Green (d) Orange

Q9. The part of the seed which is also known as embryonic leaf : [1]

- (a) Embryo (b) Cotyledon
(c) Radicle (d) Plumule

Q10. Select the incorrect statement about budding : [1]

- (a) A bud always arises from a particular region on a parent body
(b) A bud may arise from any part of the parent cell
(c) Before detaching from the parent body, a bud may form another bud
(d) A bud may separate from the parent body and develops into a new individual

Q11. To show experimentally that zinc is more reactive than copper, the correct procedure is to : [1]

- (a) prepare copper sulphate solution and dip zinc strip into it
(b) prepare zinc sulphate solution and dip copper in it
(c) heat zinc and copper strip
(d) add dilute nitric acid on both the strips

Q12. The positions of four elements X, Y, Z and P in the modern periodic table are shown below. Which of the following is the correct order of increasing electro-negativity of the elements? [1]

	Z																	X	
P																			

- (a) $X < Y < Z < P$ (b) $Y < X < Z < P$
(c) $P < Z < Y < X$ (d) $Z < P < Y < X$

OR

Consider the following statements about bases.

I. Bases have bitter taste and soapy touch.

II. With carbon dioxide, they form salt and water.

III. The gas evolved with zinc metal extinguishes a lightning splinter. [1]

The correct statements (s) is/are:

- (a) I and II (b) II and III
(c) only I (d) all of these

(Q.no 13 to 14) In each of the following questions, a statement of Assertion is given by the corresponding statement of Reason. Of the statements, mark the correct answer as.

(a) If assertion is true and reason is correct explanation of assertion.

(b) If assertion is true but reason is false.

(c) If assertion is false but reason is true.

(d) If both are false.

Q13. **Assertion** : Halides (chloride, bromide and iodide) of silver are kept in dark brown or black bottle.

Reason : The halides of silver on absorbing sunlight decompose to form silver metal and halogen. [1]

Q14. **Assertion** : The use of iodised salt is advisable.

Reason : Iodine is essential for the synthesis of thyroxine hormone in thyroid gland. [1]

SECTION B

Q15. i. Name a metal for each case :

(a) It does not react with cold as well as hot water but reacts with steam.

(b) It does not react with any physical state of water.

ii. When calcium metal is added to water the gas evolved does not catch fire but the same gas evolved on adding sodium metal to water catches fire. Why is it so ? [3]

Q16. The electronic configuration of an element 'X' is 2, 8, 8, 2. To which (a) period and (b) group of the modern periodic table does X' belong? State its valency. Justify your answer in each case. [3]

OR

Four elements P, Q, R and S have atomic numbers 12, 13, 14, and 15 respectively. Answer the following questions giving reasons :

i. What is the valency of Q ?

ii. Classify these elements as metals and non-metals.

iii. Which of these elements will form the most basic oxide ? [3]

Q17. A compound which is prepared from gypsum has the property of hardening when mixed with a proper quantity of water. Identify the compound. Write the chemical equation for its preparation. For what purpose is it used in hospitals ? [3]

- Q18. Explain with the help of suitable examples why certain traits cannot be passed on to the next generation. What are such traits called ? [3]

OR

A cross was carried out between a pure bred tall pea plant and a pure bred dwarf pea plant and F_1 progeny was obtained. Later, the F_1 progeny was selfed to obtain, F_2 progeny. Answer the following questions.

- i. What is the phenotype of the F_1 progeny and why?
 - ii. Give the phenotype ratio of the F_2 progeny.
 - iii. Why is the F_2 progeny different from the F_1 progeny ? [3]
- Q19. How are the fats digested in our bodies ? Where does this process take place ? [3]
- Q20. (i) Why fertilisation is only possible, if copulation takes place during the middle of menstrual cycle? Also, name the process which gets temporarily stopped, when a woman gets pregnant.
(ii) Prenatal sex-determination has been banned in India. Comment. [3]
- Q21. Calculate the amount of charge that would flow in one hour through the element of an electric iron drawing a current of 0.4 A. [3]
- Q22. i. What is the total resistance of n resistors each of resistance 'R' connected in: (a) series ? (b) parallel?
ii. Calculate the resultant resistance of 3 resistors $3\ \Omega$, $4\ \Omega$ and $12\ \Omega$ connected in parallel. [3]
- Q23. Why does the pH of the mouth change after taking meals ? What harm is associated with it and how can it be overcome ? [3]
- Q24. An object placed on a metre scale at 8 cm mark was focused on a white screen placed at 92 cm mark, using a converging lens placed on the scale at 50 cm mark. [3]
- i. Find the focal length of the converging lens.
 - ii. Find the position of the image formed if the object is shifted towards the lens at a position. of 29.0 cm.
 - iii. State the nature of the image formed if the object is further shifted towards the lens.

OR

When and where do we see a rainbow? How is a rainbow formed? Draw a labelled diagram to illustrate the formation of a rainbow [3]

SECTION C

- Q25. An element X (atomic number 17) reacts with an element Y (atomic number 20) to form a divalent halide.
- i. Where in the periodic table are elements X and Y placed ?
 - ii. Classify X and Y as metal (s), non-metal(s) or metalloid(s)
 - iii. What will be the nature of the oxide of element Y? Identify the nature of bonding in the compound formed.
 - iv. Draw the electron dot structure of the divalent halide. [5]

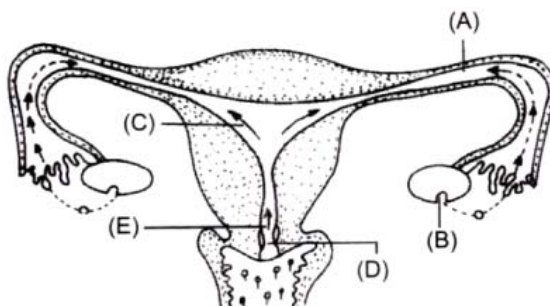
OR

An organic compound 'X' on heating with conc. H_2SO_4 forms a compound 'Y' which on addition of one molecule of hydrogen in the presence of nickel forms a compound 'Z'. One molecule of compound 'Z' on combustion forms two molecules of CO_2 and three molecules of H_2O . Identify giving reasons the compounds 'X', 'Y' and 'Z'. Write the chemical equations for all the chemical reactions involved. [5]

- Q26. i. State your observations when electric current is passed through acidulated water contained in a voltmeter, such that each electrode has been covered by a test tube containing water.
 ii. How will you test the gas evolved?
 iii. Write an electrochemical equation for the reaction. [5]
- Q27. i. Draw a diagram of the Human Alimentary Canal and label on it: Oesophagus, Gall bladder, Liver and Pancreas.
 ii. Explain the statement, 'Bile does not contain any enzyme but it is essential for digestion.' [5]
- Q28. What is pollination? How does it occur in plants? How does pollination lead to fertilization? Explain. [5]

OR

- i. Name the parts labelled A, B, C, D and E.
 ii. Where do the following functions occur ?



- (a) Production of an egg
 (b) Fertilisation
 (c) Implantation of zygote
- iii. What happens to the lining of uterus;
 (a) before release of a fertilized egg ?
 (b) if no fertilisation occur ? [5]
- Q29. i. To construct a ray diagram we use two light rays which are so chosen that it is easy to know their directions after reflection from the mirror. List these two rays and state the path of these rays after reflection. Use these two rays to locate the image of an object placed between infinity and the centre of curvature of a concave mirror
 ii. Draw a ray diagram to show the formation of image of an object placed between the pole and principal focus of a concave mirror. How will the nature and size of the image formed change, if the mirror is replaced by a converging lens of same focal length ? [5]
- Q30. i. What is a solenoid ? Draw a sketch of the pattern of the field lines of the magnetic field through and around a current carrying solenoid.
 ii. Consider a circular loop of wire lying in the plane of the table. Let the current pass through the loop clockwise. Apply the right hand rule to find out the direction of the magnetic field inside and outside the loop. [5]

OR

When two resistors of resistances R_1 and R_2 are connected in parallel, the net resistance is 3Ω . When connected in series, its value is 16Ω . Calculate the values of R_1 and R_2 . [5]