

Annual Examination (2023-24)

Class-IX Mathematics

Time: 2½ hrs.

Total Marks: 80

General Instructions:

1. Answers to this paper must be written on the answer sheet provided separately.
2. You will **NOT** be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper.
3. The time given at the head of this paper is the time allowed for writing the answers.
4. This question paper is divided into two Sections. Attempt **all** questions from **Section A** and any **four** questions from **Section B**.
5. Intended marks for questions or parts of questions are given in brackets along the questions.
6. All working, including rough work, must be clearly shown and should be done on the same sheet as the rest of the answer. Omission of essential working will result in loss of marks.
7. Mathematical tables are provided.

SECTION – A (40 Marks)

(Answer all questions from this Section)

Q.1. choose the correct answers to the questions from the given options: -

[15]

- i. The number $\sqrt{3}$ is
(a) Rational (b) Irrational (c) prime (d) none
- ii. The value of $(5)^0$ is
(a) 2 (b) 1 (c) 5 (d) none
- iii. Amount (A) is equal to
(a) $P+2I$ (b) $P-I$ (c) $P+I$ (d) none
- iv. $(a-b)^2$ is equal to
(a) $a^2 - b^2$ (b) $a^2 + b^2$ (c) $a^2 + b^2 - 2ab$ (d) none
- v. If $x + \frac{1}{x} = 2$ then value of $x^2 + \frac{1}{x^2}$ is equal to
(a) 1 (b) 2 (c) 4 (d) None
- vi. The sum of two numbers is 12 and their difference is 2. Then numbers
(a) 2 and 7 (b) 3 and 9 (c) 7 and 5 (d) None
- vii. $27^{\frac{4}{3}}$ is equal to
(a) 9 (b) 27 (c) 81 (d) None
- viii. Longest chord of circle is
(a) Radius (b) tangent (c) diameter (d) None
- ix. Types of frequency distributions are
(a) Three (b) two (c) four (d) None

x. Class mark is equal to

(a) $\frac{\text{upper limit} + \text{lower limit}}{2}$

(b) $\frac{\text{upper limit} - \text{lower limit}}{2}$

(c) upper limit + lower limit

(d) None

xi. Mean of first five natural numbers is

(a) 5

(b) 3

(c) 4

(d) None

xii. The area of equilateral triangle is

(a) $\frac{1}{2} \text{ base}^2$

(b) $\frac{\sqrt{3}}{2} (\text{side})^2$

(c) $\frac{\sqrt{3}}{4} (\text{side})^2$

(d) None

xiii. Radius of circle is 7 cm then circumference is

(a) 7cm

(b) 49 cm

(c) 44 cm

(d) None

xiv. A square is inscribed in a circle of radius 7 cm. Length of diagonal of square is

(a) 14 cm

(b) 44 cm

(c) 49 cm

(d) None

xv. The volume of cube is 729 cm^3 . Length of its side is:

(a) 27 cm

(b) 9 cm

(c) 18 cm

(d) None

Q. 2.

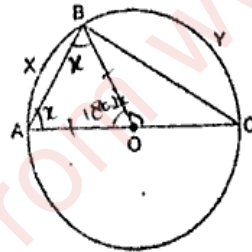
(a) Without using tables, find the value of $\frac{\sin 30^\circ - \cos 90^\circ + 2 \cos 0^\circ}{\tan 30^\circ \times \tan 60^\circ}$ [4]

(b) Evaluate: $\frac{3 \times 27^{n+1} + 9 \times 3^{3n-1}}{8 \times 3^{3n} - 5 \times 27^n}$ [4]

(c) If x and y are rational numbers and $\frac{2\sqrt{3}}{2+\sqrt{3}} = x + y\sqrt{3}$, find the values of x and y. [4]

Q. 3.

(a) In the given figure, AOC is a diameter of a circle with center O and arc AXB = $\frac{1}{2}$ BYC. Find $\angle BOC$. [4]



(b) Find xy, if $x + y = 6$ and $x - y = 4$. [4]

(c) If $\frac{\log a}{b-c} = \frac{\log b}{c-a} = \frac{\log c}{a-b}$, then prove that $a^a \cdot b^b \cdot c^c = 1$ [5]

SECTION - B (40 Marks)

(Answer any four questions from this Section)

Q. 4.

(a) There are two regular polygons with number of sides equal to $(n - 1)$ and $(n + 2)$. Their external angles differ by 6° . Find the value of n. [5]

(b) ABCD is a parallelogram, E is the mid-point of AB and F is the mid-point of CD. PQ is any line that intersects AD, EF and BC at P, G and Q. Prove that $PG = GQ$. [3]

- (c) A man borrows Rs. 5000 at 12% p.a. compound interest. He repays Rs. 2000 at the end of each year. Calculate the amount he has to pay at the end of the third year. [4]

Q. 5.

- (a) A wire is bent to form a square enclosing an area of 484 m^2 . Using the same wire, a circle is formed. Find the area of the circle. [3]
- (b) Given, $\sin \theta = \frac{p}{q}$, find $\cos \theta + \sin \theta$ in terms of p and q . [3]
- (c) If the points $(a, 0)$, $(0, b)$ and $(1, 1)$ are collinear, then prove that $\frac{1}{a} + \frac{1}{b} = 1$ [4]

Q. 6.

- (a) Factorise: $(x^2 + y^2 - z^2)^2 - 4x^2y^2$ [3]
- (b) Prove that if the diagonals of a parallelogram cut at right angles, it is a rhombus. [4]
- (c) If $3a = p\left(\frac{x}{2} - y\right)$ make 'y' the subject. Find y, when $x = 4$, $p = 5$. [3]

Q. 7.

- (a) Draw the graph of the equations $2x - 3y = 7$ and $x + 6y = 11$ and find their solutions. [4]
- (b) Express $5.\overline{457}$ in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$. [3]
- (c) The table below classifies the days of the months of June, July and August according to the rainfall received in a locality. Find the average rainfall in these three months. [3]

Rain (mm)	Days
10 - 20	8
20 - 30	10
30 - 40	14
40 - 50	20
50 - 60	15
60 - 70	8
70 - 80	7
80 - 90	6
90 - 100	4

Q. 8.

- (a) Show that in any quadrilateral the sum of all the four sides exceeds the sum of the diagonals. [3]
- (b) A and B start at the same time from two places 30 km apart. If they walk in the same directions, A overtakes B in 10 hours and if they walk in opposite directions they meet in 2 hours. Find the rates of walking of A and B. [4]

(c) Construct the C.I. and draw the histogram.

[3]

(c) Find the mean of the following data:

x	25	35	45	55	65	75
f	10	6	8	12	5	9

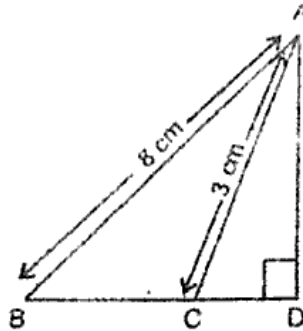
Q. 9.

(a) The mean height of the 10 girls in a class is 1.38 m and the mean height of the 40 boys is 1.44 m. Find the mean height of the 50 students of the class.

[3]

(b) In the given fig., $m\angle D = 90^\circ$, $AB = 8$ cm, $BC = 6$ cm and $CA = 3$ cm. Find CD .

[4]



(c) A rectangular water-tank measuring 80 cm \times 60 cm \times 60 cm is filled using a pipe of cross-sectional area 1.5 cm², the water emerging at 3.2 m/s. How long does it take to fill the tank?

[3]

Q. 10.

(a) Find the value of

$$\sec(90^\circ - \theta) \cdot \operatorname{cosec} \theta - \tan(90^\circ - \theta) \cot \theta + \cos^2 25^\circ + \cos^2 65^\circ + 3 \tan 27^\circ \tan 63^\circ$$

[3]

(b) Construct a rhombus $ABCD$ in which $AB = 4.5$ cm and $\angle A = 60^\circ$.

[3]

(c) Two chords AB and CD of lengths 5 cm and 11 cm respectively of a circle are parallel to each other and on opposite sides of the centre. If the distance between AB and CD is 6 cm, find the radius of the circle.

[4]

Annual Examination (2023-24)

Class- IX Chemistry

Time- 2:00hrs.

Marks- 80

Instructions :

- Answers to this paper must be written on the paper provided separately.
- You will not be allowed to write during first 15 minutes.
- This time is to be spent in reading the question paper.
- The time given at the head of this paper is the time allowed for writing the answers.
- Section A is compulsory. Attempt any four questions from Section B.
- The intended marks for questions or parts of questions are given in brackets [].
- Do proper calculation for numericals.
- Write the chemical reactions and give proper examples wherever required.

Section-A [40 Marks]

Q.1

A. Objective types questions.

[15]

- a. Elements having one electron in its valence shell.
 - i. Halogens
 - ii. Alkaline earth metals
 - iii. Noble elements
 - iv. Alkali metals.
- b. Maximum amount of solute dissolved in the given amount of solvent. The solution is?
 - i. Saturated solution
 - ii. Unsaturated solution
 - iii. Solubility
 - iv. None of these.
- c. The condition at which temperature and pressure is 273K and 760 mmHg respectively.
 - i. SATP
 - ii. NIST
 - iii. STP
 - iv. All of these.
- d. Oxidation is:
 - i. Removal of hydrogen
 - ii. Addition of oxygen
 - iii. Loss of electrons
 - iv. All of these.
- e. The temperature at which solid and liquid states are at equilibrium.
 - i. Melting point
 - ii. Boiling point
 - iii. Dew point
 - iv. None of these.
- f. The chemical reactions which occur due to electricity.
 - i. Photochemical reaction
 - ii. Electrochemical reaction
 - iii. Neutralization
 - iv. Oxidation reaction.
- g. Solubility of gases in liquid will decrease with:
 - i. Increase in pressure
 - ii. Decrease in pressure
 - iii. Decrease in temp.
 - iv. All of these.
- h. The heat required to rise 1°C temperature of any substance.
 - i. Specific heat
 - ii. Latent heat
 - iii. Melting point
 - iv. Boiling point.
- i. Chemical reaction in which heat is released.
 - i. Endothermic
 - ii. Photochemical
 - iii. Redox
 - iv. Exothermic.
- j. Electronegativity of an elementfrom left to right in a period:
 - i. Decrease
 - ii. Increase
 - iii. No change
 - iv. None of these
- k. The gas is known as silent killer.
 - i. SO₃
 - ii. N₂O₅
 - iii. CO₂
 - iv. CO
- l. The bond formed between two elements by transfer of electrons.
 - i. Covalent bond
 - ii. Ionic bond
 - iii. Co-ordinate bond
 - iv. Hydrogen bond.

- m. The bond form due to mutual sharing of electrons:
 i. Co-Valent Bond ii. Ionic Bond iii. Co-ordinate Bond iv. None of these.
- n. Elements having same number of neutrons.
 i. Isotones ii. isotopes iii. Isobars iv. Isoelectronic
- o. Temporary hardness of water is due toof Ca and Mg.
 i. Chlorides ii. Sulphate iii. Carbonates iv. Bicarbonate.

[5]

B. Fill in the blanks with suitable words:

- a. At constant temperature pressure of a gas is inversely proportional to.....
- b. The bond formed due to the mutual sharing of electrons is bond.
- c. An atom is made up of, and
- d. The air pollutants are oxides.
- e. The reaction in which oxidation and reduction both take place simultaneously is reaction.

[5]

C. Identify the following:

- a. The reaction which releases heat energy.
- b. The elements are having same number of protons.
- c. The gas which is responsible for ozone layer depletion.
- d. What kind of elements are having an acidic oxides.
- e. The saturated solution in which more solute particle can be dissolve by altering the condition.

D. Atomic numbers of the following elements are given below:

[5]

A= 11, 2, 8, 1 B= 9, 2, 2 C=20, 2, 8, 8, 2 D=18, 2, 8, 8 E= 8, 2, 6

- a. Draw the dot of structure of A and E.
- b. Which of the following is a noble gas?
- c. Which of the following is an alkali metal?
- d. Which of the following can release 2 electrons easily to attain the noble gas configuration?
- e. What kind of elements B and E are? Identify the elements.

E. Match the following:

[5]

- | | |
|---------------------------|--------------------------------|
| a. NaCl | i. Chloro Fluoro Carbon. |
| b. Ozone layer depletion | ii. Law of octaves. |
| c. NO ₂ | iii. Same number of electrons. |
| d. Newland | iv. Air pollutants. |
| e. Isc electronic species | v. Deliquescence salt. |

F. Explain the following terms:

[5]

- a. Boiling point.
- b. Henry's law.
- c. Ozone layer depletion.
- d. Neutralization reaction.
- e. Efflorescence.

Section-B [40 Marks]
(Attempt any four questions)

Q.2 Write the balanced equations for the following word equations:

- | | | | | | |
|----------------------|---|------------------|---------------|-------------------------------------|------|
| a. Sodium Sulphide | + | Sulphuric acid | \rightarrow | Sodium Sulphate + Hydrogen Sulphide | [10] |
| b. Sodium | + | Water | \rightarrow | Sodium hydroxide. | |
| c. Calcium carbonate | + | Sulphuric Acid | \rightarrow | Carbonic Acid + Calcium sulphate | |
| d. Red Hot Coke | + | steam | \rightarrow | Water gas | |
| e. Barium Chloride | + | Ferrous Sulphate | \rightarrow | Barium Sulphate. + Ferrous Chloride | |

Q.3 i. Calculate the concentration of following:

[4+6=10]

- If 30ml of alcohol is present in a solution of 200ml then determine the volume percent of the solute.
- 8g of chlorine is dissolved in 400g of water. What percent of chlorine is present by mass in water?
- What will be the minimum pressure required to compress 500 dm³ of air at 1 bar to 200 dm³, if temperature is being kept constant?
- Calculate the percentage of elements present in ammonium chloride.

Q.4 Differentiate between the following.

[10]

- Covalent bond & ionic bond.
- Polar & non polar covalent bond.
- Boyle's law & Charle's law.
- Electronegativity & Ionization enthalpy.
- Saturated & unsaturated solution.

Q.5 Give the balance equation for each of the following types of reaction:

[10]

- Dinitrogen with hydrogen gas. $N_2 + 3H_2 \rightarrow 2NH_3$
- Copper sulphate reacts with water. $CuSO_4 + H_2O \rightarrow CuH_2SO_4 + CuO$
- Sulphur trioxide treated with water. $SO_3 + H_2O \rightarrow H_2SO_4$
- Ammonium chloride treated with sodium hydroxide. $NH_4Cl + NaOH \rightarrow NaCl + 2NH_3$
- Calcium carbonate is being heated. $CaCO_3 \rightarrow CaO + CO_2$

Q.6 Define of the following terms with examples:

[10]

- Mass number and atomic mass.
- Lone pair and Valency.
- Acidic radicals and basic radicals.
- s-block elements.
- Resemblance of Hydrogen with Alkali metals and Halogens.

Q.7 Explain the following:

[10]

- Green House effect and acid rain.
- Merits and demerits of Mendeleev's periodic table

OR

Draw the structure of following:

