

SUMMATIVE ASSESSMENT III 2025-26
(MODEL QUESTION PAPER)
CHEMISTRY

Time : 1½ Hours

Std : X
Maximum Score : 40**Instructions**

- First fifteen minutes are cool off time. Read the questions carefully and plan the answers during this time.
- Write the answers according to the instructions.
- Consider the score while writing the answers.
- Answer only one question for questions having choice A and B.

Answer all the questions from 1 to 4. Each question carries 1 score.**(4 × 1 =4)**

1. Match the following.

(1)

Category	Function
(a) Analgesics	(i) control micro organism
(b) Antipyretics	(ii) reduce hair fall
(c) Antiseptics	(iii) relieve pain
	(iv) reduce body temperature

Choose the correct one from the options given below.

- | | | | |
|----|-------|-------|-------|
| | (a) | (b) | (c) |
| A. | (ii) | (i) | (iii) |
| B. | (iii) | (iv) | (i) |
| C. | (iv) | (i) | (ii) |
| D. | (ii) | (iii) | (iv) |

2. When Cu is added to con. H₂SO₄, the gas produced is,

(1)

- A. H₂
B. SO₂
C. NO₂
D. CuO

3. Which of the following statements are correct?

(1)

- i) -CHO is the functional group of aldehydes.
ii) Acetone contains only two carbon atoms.
iii) Pentanone can show position isomerism.
iv) Ethers have hydroxyl group as functional group.
- A. i & ii are correct
B. i & iii are correct
C. i & iv are correct
D. All the statements are correct

4. **Assertion (A):** In d block elements electrons fill in the outermost s subshell before filling in the penultimate d subshell.

Reason (R) : Outer 4s subshell has higher n value than penultimate 3d subshell.

Which of the following is correct? (1)

- A. Both A and R are correct, R is the correct explanation of A.
- B. Both A and R are correct, R is not the correct explanation of A.
- C. A is correct but R is not correct.
- D. A and R are not correct.

Two questions from 5 to 9 have choice. Each question carries 2 scores. (5x 2 =10)

5. The organic compounds with molecular formula $C_4H_{10}O$ show metamerism.
- a) Which category of organic compounds do these compounds belongs to? (1)
 - b) Write the structural formulae of these metamers. (1)
6. (A) Calamine and zinc blende are the ores of Zinc.
- a) Which of them can be converted to zinc oxide by calcination? (1)
 - b) Write the equation of this process. (1)

OR

- (B) a) Which is the reducing agent used to produce aluminium? (1)
- b) Why is cryolite added to alumina during the production of aluminium? (1)
7. You are given sodium chloride and water.
- a) How will you produce sodium and chlorine from the given substances? (1)
 - b) Write a method to produce hydrogen and sodium hydroxide using these substances. (1)
8. The size of an air bubble coming up from the bottom of an aquarium increases.
- a) To which gas law does this situation relate? (1)
 - b) State the law. (1)
- 9.(A) The subshell electron configuration of an element X is given. (Symbol not real)
- $$X - 1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^2$$
- a) What is the atomic number of X? (1)
 - b) Find the group to which X belong. (1)

OR

- (B) An element A belongs to 4th period. It has three electrons in its 3d subshell. (Symbol is not real)
- a) Write the subshell electron configuration of A. (1)
 - b) Write any two properties of elements belong to the block to which A belongs. (1)

Two questions from 10 to 15 have choice. Each question carries 3 scores. (6x 3 =18)

10. A saturated organic compound has four carbon atoms in its main chain and two methyl groups in its second carbon atom.

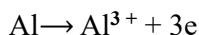
- a) Write the structural formula of this compound. (1)
- b) Write its molecular formula. (1)
- c) Write the IUPAC name of this compound. (1)

11.(A) A Galvanic cell is made using Zn and Cu as electrodes.

- a) Write the name of this galvanic cell. (1)
- b) At which electrode does oxidation take place? (1)
- c) Write the equation of redox reaction taking place in this cell. (1)

OR

(B) In a Galvanic cell Cu acts as cathode and the reaction taking place at the anode is



- a) Which salt solution is to be taken along with aluminium electrode? (1)
- b) If a magnesium rod is used instead of copper, write the direction of flow of electron? (1)
- c) Arrange Cu, Al and Mg in the decreasing order of their reactivity. (1)

12. Caustic soda is a very important chemical.

- a) Write the chemical name of caustic soda. (1)
- b) Write the name of industrial production of this compound. (1)
- c) Why is caustic soda considered as an alkali? (1)

13. Iron is a very useful metal.

- a) Why is limestone added along with the iron ore to blast furnace? (1)
- b) Which is the substance used to reduce iron ore? (1)
- c) Write the name of iron obtained from the blast furnace? (1)

14.(A) Orbitals and subshells are associated with certain quantum numbers.

- a) Find the $n+l$ values of 3p and 4s subshells. (1)
- b) Which of them has more energy? Justify your answer. (2)

OR

(B) A subshell has an n value 3 and l value 2.

- a) Represent the given subshell. (1)
- b) What is the maximum number of electrons that can be accommodated in this subshell? (1)
- c) How many orientations are possible for the orbitals of this subshell? (1)

15. Ammonia is essential for plant growth.

- a) Write the equation of production of NH_3 by Haber Process. (1)
- b) What is the effect of pressure in the reaction after reaching equilibrium? (1)
- c) Why 450°C is used as optimum temperature in Haber process? (1)

One question from 16 to 17 has choice. Each carries 4 score.

(2 x 4 = 8)

16. (A) A sample of CO_2 gas contains 176 g of carbon dioxide.

- a) What is the volume of the sample at STP? (2)
 - b) How many grams of carbon should be burnt to get this amount of CO_2 ? (2)
- (Atomic mass, C = 12, O = 16)

OR

(B) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$ is the equation of formation of water.

- a) What is the mass of O_2 gas needed to get 36 g of water? (1)
- b) Find the volume of H_2 gas needed to get 22.4 L of H_2O vapour at STP? (2)
- c) If we take 4 g of hydrogen, how much gram of O_2 should be taken to react completely with this hydrogen? (1)

17. $\text{CH}\equiv\text{CH}$ is an alkyne. Starting from this alkyne how are the following compounds formed?

- a) $\text{CH}_3 - \text{CH}_3$ (1)
- b) $\text{CHCl}_2 - \text{CHCl}_2$ (1)
- c) $\text{CH}_2 = \text{CHCl}$ (1)
- d) PVC (1)

SUMMATIVE ASSESSMENT III 2025-26
CHEMISTRY
ANSWER KEY

Qn No.	Sub Qn.	Value point	Score	Total score
1		B	1	1
2		B	1	1
3		B	1	1
4		B	1	1
5	a	Ethers	1	2
	b	CH ₃ -CH ₂ -O-CH ₂ -CH ₃ , CH ₃ -O-CH ₂ -CH ₂ -CH ₃	1	
6A	a	Calamine	1	2
	b	ZnCO ₃ → ZnO + CO ₂	1	
OR				
6B	a	Electricity	1	2
	b	To reduce the melting point of alumina and to increase the electrical conductivity	1	
7	a	By the electrolysis of molten NaCl	1	2
	b	By the electrolysis of aqueous NaCl solution	1	
8	a	Boyle's law	1	2
	b	Statement of Boyle's law	1	
9A	a	25	1	2
	b	7	1	
OR				
9B	a	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ³ 4s ²	1	2
	b	i) They form coloured compounds ii) They exhibit variable oxidation states (Any two properties of d-block elements)	1	
10	a	<div>CH₃ CH₃ - C - CH₂ - CH₃ CH₃</div>	1	3
	b	C ₆ H ₁₄	1	
	c	2,2-Dimethylbutane	1	
11 A	a	Daniel cell	1	3
	b	Zn	1	
	c	Zn + CuSO ₄ → ZnSO ₄ + Cu / Zn ²⁺ + Cu → Zn + Cu ²⁺	1	
OR				
11 B	a	Aluminium sulphate solution / aqueous solution of any aluminium salt	1	3
	b	Mg to Al	1	
	c	Mg > Al > Cu	1	

12	a	NaOH	1	3
	b	Chlor alkali process	1	
	c	NaOH increases the concentration of hydroxide ions in aqueous solutions	1	
13	a	It dissociates at high temperature to give CaO which acts as flux	1	3
	b	CO/ Carbon monoxide	1	
	c	Pig iron	1	
14A	a	3p - 4s- $n+l = 3+1=4$ $n+l = 4 + 0=4$	1	3
	b	4s has more energy because, as both have same $n+l$ values, 4s having higher n value is considered to have higher energy.	2	
OR				
14B	a	3d	1	3
	b	10	1	
	c	5	1	
15	a	$N_2 + 3H_2 \rightarrow 2NH_3 + \text{heat}$	1	3
	b	When pressure is increased, the rate of forward reaction increases	1	
	c	At lower temperatures, the number of molecules having threshold energy will be less and so 450°C is taken as optimum temperature.	1	
16A	a	Molecular mass of $CO_2 = 44$ No of moles of CO_2 in 176 g of $CO_2 = 176/ 44 = 4$ mols Volume of 1 mole CO_2 at STP = 22.4 L Volume of 4 moles of CO_2 at STP = $4 \times 22.4 = 89.6$ L	2	4
	b	$C + O_2 \rightarrow CO_2$ 1 mole of C gives 1 mole of CO_2 For obtaining 4 mols of CO_2 , 4 mols of C should be burnt. Mass of 1 mol of C =12 g Mass of 4 mols of C = $4 \times 12 = 48$ g	2	
OR				
16B	a	32 g	1	4
	b	2 mols of H_2 gives 2 mols of H_2O 1 mol of H_2 gives 1 mol of H_2O Volume of H_2 required to give 22.4 L H_2O at STP = 22.4 L	2	
	c	2 mol H_2 needs 1 mole of O_2 4g of H_2 needs 32 g of O_2	1	
17	a	By the addition of 2 H_2 molecules/ chemical equation	1	4
	b	By the addition of 2 Cl_2 molecules/ chemical equation	1	
	c	By the addition of HCl molecule/ chemical equation	1	
	d	By the addition of HCl molecule followed by polymerisation/ chemical equation.	1	