



Class No. : .....

**FY 125**

Name : .....

**FIRST YEAR HIGHER SECONDARY SECOND TERMINAL  
EXAMINATION, DECEMBER 2024**

**Part – III  
CHEMISTRY  
Maximum : 60 Scores**

Time : 2 Hours

Cool-off Time : 15 Minutes

**General Instructions to Candidates :**

- There is a 'Cool off time' of 15 minutes in addition to the writing time.
- Use 'cool off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Give equations wherever necessary.
- Malayalam version of the questions is also provided.
- Electronic devices except non programmable calculators are not allowed in the Examination Hall.

**വിദ്യാർത്ഥികൾക്കുള്ള പൊതുനിർദ്ദേശങ്ങൾ :**

- നിർദ്ദിഷ്ട സമയത്തിന് പുറമെ 15 മിനിറ്റ് 'കൂൾ ഓഫ് ടൈം' ഉണ്ടായിരിക്കും.
- 'കൂൾ ഓഫ് ടൈം' ചോദ്യങ്ങൾ പരിചയപ്പെടാനും ഉത്തരങ്ങൾ ആസൂത്രണം ചെയ്യാനും ഉപയോഗിക്കുക.
- ഉത്തരങ്ങൾ എഴുതുന്നതിന് മുമ്പ് ചോദ്യങ്ങൾ ശ്രദ്ധാപൂർവ്വം വായിക്കണം.
- കണക്ക് കൂട്ടലുകൾ, ചിത്രങ്ങൾ, ഗ്രാഫുകൾ, എന്നിവ ഉത്തരപേപ്പറിൽ തന്നെ ഉണ്ടായിരിക്കണം.
- ആവശ്യമുള്ള സ്ഥലത്ത് സമവാക്യങ്ങൾ കൊടുക്കണം.
- ചോദ്യങ്ങൾ മലയാളത്തിലും നൽകിയിട്ടുണ്ട്.
- പ്രോഗ്രാമുകൾ ചെയ്യാനാകാത്ത കാൽക്കുലേറ്ററുകൾ ഒഴികെയുള്ള ഒരു ഇലക്ട്രോണിക് ഉപകരണവും പരീക്ഷാഹാളിൽ ഉപയോഗിക്കുവാൻ പാടില്ല.

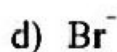
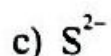
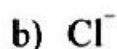
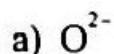


**Score**

**Answer any four questions from 1 to 5. Each carries 1 score.**

**(4×1=4)**

1. Which of the following represents the symbol of the species that contain 18 electrons, 16 protons and 16 neutrons respectively ?



2. Which of the following has the highest value of electronegativity ?

a) P

b) F

c) S

d) Cl

3. The hybridized state of carbon in  $C_2H_4$  is \_\_\_\_\_

4. In the following question a statement of Assertion (A) followed by a statement of Reason (R) is given.

**Assertion (A)** : A liquid crystallises into a solid and is accompanied by decrease in entropy.

**Reason (R)** : In crystals, molecules organise in an ordered manner.

Choose the correct option out of the choices given below :

i) Both A and R are true and R is the correct explanation of A

ii) Both A and R are true but R is not the correct explanation of A

iii) A is true but R is false

iv) A is false but R is true

5. What will be the conjugate base for the Bronsted acid : HF ?



Score

Answer any eight questions from 6 to 15. Each carries 2 scores.

(8×2=16)

6. The following data are obtained when dinitrogen and dioxygen react together to form different compounds :

	Mass of dinitrogen	Mass of dioxygen
(i)	14 g	16 g
(ii)	14 g	32 g

Which law of chemical combination is obeyed by the above experimental data ?

Write its statement.

7. The threshold frequency  $\nu_0$  for a metal is  $7.0 \times 10^{14} \text{ s}^{-1}$ . Calculate the kinetic energy of an electron emitted when radiation of frequency  $\nu = 1.0 \times 10^{15} \text{ s}^{-1}$  hits the metal.
8. i) State modern periodic law. (1)
- ii) Write the IUPAC name of the element with  $Z = 109$ . (1)
9. Write any two differences between sigma and pi bonds.
10. Explain intermolecular hydrogen bonding with the help of suitable examples.



11. Match the following :

A	B
i) Adiabatic process	a) Specific heat capacity
ii) Free expansion	b) At constant pressure
iii) $\Delta H = q$	c) Entropy
iv) Intensive property	d) No transfer of heat
	e) $p_{\text{ext}} = 0$

12. For the following equilibrium,  $K_c = 6.3 \times 10^{14}$  at 1000 K.

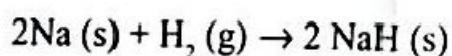


Both the forward and reverse reactions in the equilibrium are elementary bimolecular reactions. What is  $K_c$ , for the reverse reaction ?

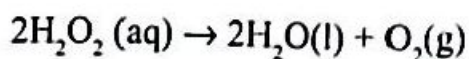
13. The concentration of hydrogen ion in a sample of soft drink is  $3.8 \times 10^{-3}$  M.

What is its pH ?

14. Identify the oxidant and reductant in the following reaction.



15. What are disproportionation reactions ? Justify that the following reaction is a disproportionation reaction.



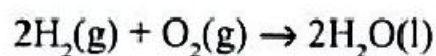


**Score**

**(8×3=24)**

**Answer any eight questions from 16 to 26. Each carries 3 scores.**

**16. 2 mol H<sub>2</sub>(g) mixed with 1 mol O<sub>2</sub>(g) and allowed to react as given below :**



i) How many molecules of H<sub>2</sub> and O<sub>2</sub> were initially present ? (1)

ii) How many atoms of H and O will be there in the product ? (1)

iii) How many molecules of H<sub>2</sub>O were formed ? (1)

**17. Define photoelectric effect. Write any two results observed in the Photoelectric effect experiment.**

**18. i) Calculate the radius of Bohr orbit for Hydrogen atom. (1)**

ii) Write any two limitations of Bohr model for Hydrogen atom. (2)

**19. Define electron gain enthalpy. Which among O and S has more negative electron gain enthalpy ? Give reason.**

**20. Draw the Lewis structure of O<sub>3</sub> and assign formal charge on each atom.**

**21. Write the Molecular orbital configuration of N<sub>2</sub>. Calculate its bond order and also predict magnetic behavior.**

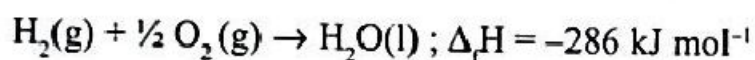
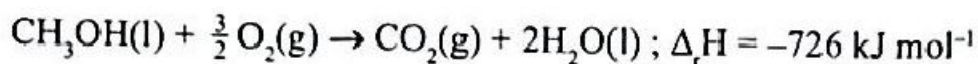


Score

22. i) State First Law of Thermodynamics. (1)

ii) Express the change in internal energy ( $\Delta U$ ) of a system when no heat is absorbed by a system from the surroundings, but work ( $w$ ) is done on the system. What type of wall does the system have? (2)

23. Calculate the standard enthalpy of formation of  $\text{CH}_3\text{OH}(\text{l})$  from the following data :



24. i) Define :

a) entropy (1)

b) free energy (1)

ii) Which among the following is correct for a spontaneous process? (1)

a)  $\Delta S > 0, \Delta G < 0$

b)  $\Delta S > 0, \Delta G > 0$

c)  $\Delta S = 0, \Delta G = 0$

d)  $\Delta S = 0, \Delta G > 0$