Reg. No. | | | | | | | | |

**G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.**

**UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.**

(For those admitted in June 2023 and later)

**PROGRAMME AND BRANCH: B.Sc., PHYSICS**

| SEM | CATEGORY | COMPONENT | COURSE CODE | COURSE TITLE |
|---|---|---|---|---|
| III | PART - III | ELECTIVE GENERIC - 3 | U23CH3A3 | CHEMISTRY FOR PHYSICAL SCIENCES – I |

**Date & Session:24.04.2025/AN** **Time : 3 hours** **Maximum: 75 Marks**

| Course Outcome | Bloom's K-level | Q. No. | **SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.** |
|---|---|---|---|
| CO1 | K1 | 1. | Elements with same mass and atomic numbers while different radioactive properties are called as an _____. a) Isobars b) Isotones c) Isotopes d) Isomers |
| CO1 | K2 | 2. | The bond order of $N_2$ molecule is. a) 1 b) 2 c) 3 d) 0 |
| CO2 | K1 | 3. | The percentage of Nitrogen in Urea is _____. a) 70 b) 90 c) 30 d) 47 |
| CO2 | K2 | 4. | Which of the following material is used as lubricant in aeroplanes? a) Silicone grease b) Freon c) Carburetted gas d) Natural gas |
| CO3 | K1 | 5. | Electrophilic reaction is takes place in _____ position of pyrrole. a) 4 b)1 c) 2 d) 3 |
| CO3 | K2 | 6. | +I effect group is. a) -H b) –OH c) –Cl d) $-CH_3$ |
| CO4 | K1 | 7. | For the process to occur under adiabatic conditions, the correct condition is. a) $\Delta T = 0$ b) $\Delta P = 0$ c) $\Delta q = 0$ d) $\Delta w = 0$ |
| CO4 | K2 | 8. | The least random state of water system is _____. a) Ice b) liquid water c) steam d) randomness is same |
| CO5 | K1 | 9. | Choose the process most commonly used for the purification of solid organic compounds. a) distillation b) crystallisation c) soxhlet extraction d) melting |
| CO5 | K2 | 10. | The stationary phase in column chromatography is _____. a) Alumina b) water c) Petroleum ether d) cellulose |
| **Course Outcome** | **Bloom's K-level** | **Q. No.** | **SECTION – B (5 X 5 = 25 Marks) Answer ALL Questions choosing either (a) or (b)** |
| CO1 | K3 | 11a. | Sketch the MO formation and discuss the information obtained from MO diagram. **(OR)** |
| CO1 | K3 | 11b. | What is nuclear fusion? Describe the principle of hydrogen bomb. |
| CO2 | K3 | 12a. | Illustrate the preparation and uses of i) Oil gas ii) water gas. **(OR)** |
| CO2 | K3 | 12b. | Discuss the preparation and properties of silicones. |

| | | | |
|---|---|---|---|
| CO3 | K4 | 13a. | Examine the preparation and chemical reaction of pyridine.<br>**(OR)** |
| CO3 | K4 | 13b. | Define inductive effect and analyse the application of inductive effect. |
| CO4 | K4 | 14a. | List out the differences between reversible and irreversible reactions.<br>**(OR)** |
| CO4 | K4 | 14b. | Draw and discuss the phase diagram of $H_2O$ molecule. |
| CO5 | K5 | 15a. | Describe the separation technique used to separate a liquid from its mixture.<br>**(OR)** |
| CO5 | K5 | 15b. | Discuss the classification of Chromatography with example. |

| **Course Outcome** | **Bloom's K-level** | **Q. No.** | **SECTION – C (5 X 8 = 40 Marks)**<br>**Answer ALL Questions choosing either (a) or (b)** |
|---|---|---|---|
| CO1 | K3 | 16a. | Distinguish i) Nuclear reaction and thermal reaction and ii) Bonding and Antibonding orbitals.<br>**(OR)** |
| CO1 | K3 | 16b. | Show the application of radioisotopes in i) Medicine and ii) carbon dating |
| CO2 | K4 | 17a. | Explain the synthesis, properties and uses of i) Urea and ii) Superphospate of lime.<br>**(OR)** |
| CO2 | K4 | 17b. | Elucidate the preparation and uses of i) LPG and ii) CNG |
| CO3 | K4 | 18a. | What is meant by hybridisation and discuss any two type of hybridisation<br>**(OR)** |
| CO3 | K4 | 18b. | Examine the Steric effect with special reference to their influence on the reactions of the group. |
| CO4 | K5 | 19a. | Discuss in detail about the reduced phase rule. Explain its application to a simple two component system.<br>**(OR)** |
| CO4 | K5 | 19b. | Define entropy and Gibb's free energy. Write their significance. |
| CO5 | K5 | 20a. | Describe the principle and application of Paper chromatography and ion-exchange chromatography<br>**(OR)** |
| CO5 | K5 | 20b. | Explain the various type of volumetric titrations. Discuss briefly Acid –base titration. |