**TEMPLATE 5**

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| **University of Kerala** | | |
| Discipline: POLYMER CHEMISTRY |  | Time: 1 Hour 30 Minutes (90 Mins.) |
| Course Code: UK1DSCPOC103 |  | Total Marks: 42 |
| Course Title: Basics of Physical Chemistry I |  |  |
| Type of Course: DSC |  |  |
| Semester: 1 |  |  |
| Academic Level: 100-199 |  |  |
| Total Credit: 4, Theory: 3 Credit  (Applicable for 4 Credit Course with 1 Credit Practical Also) |  |  |

Part A. 6 Marks. Time: 6 Minutes

Objective Type. 1 Mark Each. Answer All Questions

(Cognitive Level: Remember/Understand)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 1. | Surface tension may be defined as……… | Remember | CO-1 |
| 2. | What is the principle of viscosity? | Remember | CO-1 |
| 3. | Give the mathematical expression for enthalpy | Understand | CO-2 |
| 4. | During the reversible isothermal expansion of an ideal gas, how does internal energy change? | Understand | CO-2 |
| 5. | If the initial concentrations of reactants in a reaction increase then the equilibrium constant ……..\_\_\_\_\_\_\_\_\_\_\_\_ | Understand | CO-3 |
| 6. | What do you mean by auto catalysis? | Understand | CO-4 |

Part B. 8 Marks. Time: 24 Minutes

Short Answer. 2 Marks Each. Answer All Questions

(Cognitive Level: Understand/Apply)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 7. | State and explain Beer –Lambert’s law | Understand | CO-4 |
| 8. | What are the factors which favour the formation of ammonia? | Understand | CO-3 |
| 9. | A sample of an ideal gas occupies 5L at a temperature of 300 K and a pressure of 3 atm. Use the ideal gas equation to calculate the number of moles of gas present. | Apply | CO-2 |
| 10. | How does temperature affect the surface tension of a liquid? | Apply | CO-1 |

Part C. 28 Marks. Time: 60 Minutes

Long Answer. 7 marks each. Answer all 4 Questions, choosing among options within each question.

(Cognitive Level: Apply/Analyse/Evaluate/Create)

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| **Qn.**  **No.** | **Question** | **Cognitive**  **Level** | **Course**  **Outcome (CO)** |
| 11. | a) Explain Fluorescence, Phosphorescence and Photosensitization with examples  OR  b) Explain the mechanism of 1) heterogenous catalysis 2)enzyme catalysis | Apply | CO-4 |
| 12. | a) How an adiabatic process differs from an isothermal process? What would happen to the internal energy of a gas during a compression process in both cases?  OR  b) i. Three moles of an ideal gas expand reversibly and isothermally from 5 L to 20 L at 298 K. Calculate the work done.  ii. Compare the work done, heat transferred, internal energy change, and enthalpy change for a reversible isothermal and adiabatic expansion of an ideal gas . | Apply | CO-2 |  |
| 13. | a) Derive Van’t Hoff equation and explain its significance  OR  b) Explain briefly the Dynamic equilibrium | Analyze | CO-3 |  |
| 14 | Discuss the property of viscosity in liquids, including its significance and factors affecting on it.  OR  Expalin the seven crystal systems. Give examples | Analyze | CO-1 |

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| **Cognitive Level** | **Marks** | **Percentage** |  | **Course Outcomes** | **Marks** | **Percentage** |
| Remember | 2 | 4.8 |  | CO-1 | 11 | 26.2 |
| Understand | 8 | 19.0 |  | CO-2 | 11 | 26.2 |
| Apply | 18 | 42.9 |  | CO-3 | 10 | 23.8 |
| Analyse | 14 | 33.3 |  | CO-4 | 10 | 23.8 |
|  |  |  |  |  |  |  |
| **TOTAL** | **42** | **100** |  | **TOTAL** | **42** | **100** |