

**VIT**Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

REG. NO.:

**SCHOOL OF ADVANCED SCIENCES
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026**

SLOT: G2+TG2

Programme Name & Branch : B. Tech. Computer Science and Engineering
Course Code and Course Name : BACHY105 and Applied Chemistry
Faculty Name(s) : Akhila Maheswari, Buvaneshwari G, Satish Kumar G,
 Manju S.L, Sumathi S, Suseem S.R, Prabhakaran D,
 Asharani I.V, Mohana Roopan S, Madhumitha G, Sugata
 Goswami, Ramesh Kumar S, VV Ramesh, Napoleon A.A,
 Tapas Ghatak

Class Number(s) : VL2025260106527, 6531, 6535, 6539, 6543, 6547, 6551,
 6555, 6559, 6563, 6567, 6571, 6577, 6734, 6851

Date of Examination : 23 August, 2025
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level
(1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcome:
 - CO1: Understand the fundamental concepts in physical, analytical and materials chemistry.

QN	Question	M	CO	BL
1.	Discuss the reversible and irreversible work done by one mole gas in an isothermal process using a diagram and appropriate equations. What is the change in internal energy for an isothermal process for a mole of ideal gas?	10	1	2
2.	A reversible heat engine operates between the hot source (T_h) and heat sink (T_c). Derive the efficiency of the engine and explain all the processes on PV-diagram. How will you design your strategy to maximise its efficiency?	10	1	3
3.	(a) 1 mole of an ideal gas expand reversibly and isothermally from a pressure of 10 atm to 5 atm at 300 K. Calculate the work done. - 1728	5	1	3
	(b) Calculate the change in entropy accompanying the heating of 5 mole of ideal gas from a temperature of 350 K to a temperature of 800 K at constant pressure. Assume $C_v = 3/2 R$ 85-01	5		
4.	(a) Write the factors affecting the rate of a chemical reaction. How temperature effect on the rate constant of a chemical reaction? Explain using the mathematical model.	5	1	2
	(b) The half-life of an ester hydrolysis was found to be 30 min at a certain temperature. What is its rate constant? 0.0231 min⁻¹	5		
5.	What is the role of the catalysts in the chemical reaction explain using a energy diagram? Give two examples each for homogeneous and heterogenous catalysts using chemical equations.	10	1	1