



VIT

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

REG.NO.:

SCHOOL OF CHEMICAL ENGINEERING
CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2025-2026

SLOT: C2+TC2+TCC2

Programme Name & Branch : B.Tech Chemical Engineering
Course Code and Course Name : BCHE304L Chemical Process Technology & Economics
Faculty Name(s) : Dr. Aruna Singh
Class Number(s) : VL2025260101247
Date of Examination : 07-10-2025
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- Use Graph sheet wherever necessary
- For comparative based questions, write 10 points in each topic
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- **Course Outcomes**
 1. CO3: Identify the manufacturing processes in the fertilizer industry.
 2. CO4: Describe Sugar, Soap manufacturing and Petroleum refining.

Q.No.	Question	Max Marks	CO	BL
1.	Compare Hydrotreating and Thermoform Catalytic Cracking Process for the purification of desired petroleum products	10	4	3
2.	Explain the changes encountered in the system when the following changes are suggested during the manufacture of phosphoric acid and chemical fertilizer from phosphate rock by the strong acid process. a) Use of one neutralizing unit instead of three no's of neutralizing units b) Replacing single effect evaporator with multiple effect evaporator c) Use of Rotary filter instead of a travelling pan filter d) Use of the Tray dryer instead of the Rotary dryer e) Use of Sinterer instead of a grinder.	10	3	2
3.	A company plans to study the feasibility by integrating (combining) the production of wood pulp by the sulfate process and the production of white liquor from black liquor (black liquor is used as feed from the sulfate process). During the integration (combining), the following recommendations were suggested by the company. (i) Use of Blender instead of Mix Tank (ii) Use of Single Effect Evaporator System instead of multiple effect evaporator system (iii) Separation of boiler unit and combustion chamber and use as individual units rather than fused chamber.	10	4	4



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- (iv) Use of Electrostatic precipitator instead of Cottrell Precipitator
(v) Use of Centrifugation unit instead of Clarifier unit which recovers the sludge from green liquor
(vi) Continuous digester unit to be segregated into 3 separate (individual) units based on difference in Temperature.
(vii) Avoid using the Lime Slaker unit. Treat the lime directly into the causticizing tank

Draw a neat flowsheet and report as a single flowsheet incorporating all the suggestions recommended by the company during integrating (combining) production of wood pulp by the sulfate process and production of white liquor from black liquor (black liquor is used as feed from the sulfate process). Explain the changes encountered in the system with the points suggested by the company.

4. Differentiate between primary refining and secondary refining processes

10

3

2

5. Describe the impact of the chemical industry in India due to the Ukraine-Russia War and the 50% Tariff imposed by US President Donald Trump.

10

3

4
