



SEVENTH SEMESTER B. TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER EXAMINATIONS, DEC 2016/JAN 2017

SUBJECT: INSTRUMENTATION AND CONTROL IN PETROCHEMICAL INDUSTRIES [ICE 441]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ANY FIVE FULL** questions.
- ❖ Missing data may be suitably assumed.
- ❖ Draw the sketches wherever necessary.

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| 1A. | Explain the process of distillation and its need. | 2 |
| 1B. | Discuss the packing and trays in distillation column control. | 3 |
| 1C. | Briefly discuss the column variables and pairing of variables with sketch. | 5 |
| 2A. | Define single effect and multiple effect evaporation. | 2 |
| 2B. | Write short note on vertical tube evaporator with its sketch. | 3 |
| 2C. | Illustrate the Feed-Forward control for the evaporator to maintain the product density. | 5 |
| 3A. | What are the factors to be considered for the evaporator design. | 2 |
| 3B. | Draw the P&I diagram of the Valve Position Controller scheme for the two stage evaporator. | 3 |
| 3C. | Explain the cascade control configuration of the two stage evaporator. | 5 |
| 4A. | Give an over view of Rotary pump. | 2 |
| 4B. | With the characteristic curve explain the speed control of centrifugal pump. | 3 |
| 4C. | Write a short note on metering of pumps. | 5 |
| 5A. | List the limitations of cascade control in chemical reactor. | 2 |
| 5B. | What are the effects of equilibrium constant "k" in a reactor. | 3 |
| 5C. | Explain the temperature control of a chemical reactor. | 5 |
| 6A. | Draw the diagram of a double drum dryer. | 2 |
| 6B. | Explain the spray dryer with single loop control. | 3 |
| 6C. | Describe the safety interlocks in boiler operations. | 5 |