

Reg. No.									
----------	--	--	--	--	--	--	--	--	--



**MANIPAL INSTITUTE OF TECHNOLOGY**  
MANIPAL

*A Constituent Institution of Manipal University*

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

**END SEMESTER EXAMINATIONS, DEC - 2017**

SUBJECT: INSTRUMENTATION AND CONTROL IN PETROCHEMICAL INDUSTRIES [ICE 4006]

Duration: 3 Hour

Max. Marks:50

### Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

- |           |   |   |
|-----------|---|---|
| <b>1A</b> | With a neat diagram explain crude oil distillation process in petroleum industry.   | 4 |
| <b>1B</b> | Develop a steady state model for a double effect evaporator.  | 4 |
| <b>1C</b> | What is adiabatic drying?   | 2 |
| <b>2A</b> | Explain temperature control in a chemical reactor and its limitations for cascade control in chemical reactor.  | 6 |
| <b>2B</b> | Define the following evaporator terminologies. i. Single-effect evaporation    ii. Boiling point rise<br>iii. Economy                          iv. Capacity | 4 |
| <b>3A</b> | How the efficiency of distillation column can be increased by vapor recompression pressure control? Explain with illustration.                              | 5 |
| <b>3B</b> | What are the different types of packing's and trays used in a distillation column? Explain with diagrams.   | 5 |
| <b>4A</b> | Explain inferential control of batch dryer with re-circulated air.  | 5 |
| <b>4B</b> | List the various refining processes.  | 3 |
| <b>4C</b> | List the various safety interlocks in boiler.   | 2 |
| <b>5A</b> | Explain Double-drum dryer with neat diagram.  | 4 |
| <b>5B</b> | Draw the diagram of a diverter and mixing valve. Explain the working.   | 4 |
| <b>5C</b> | Explain direct-fired dryers.  | 2 |