

Total No. of Questions : 10]

SEAT No. :

**P3654**

**[5560]-610**

[Total No. of Pages : 2

**T.E. (Chemical Engg.)**

**PROCESS INSTRUMENTATION AND CONTROL**

**(2015 Pattern) (Semester - II) (End Sem.) (309352)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam table is allowed.*
- 5) *Assume Suitable data if necessary.*

- Q1)** a) Explain functional elements of instruments in detail. [5]  
b) Explain the difference between accuracy and precision in an instrument. [5]

OR

- Q2)** a) Explain Optical pyrometer with neat diagram. [5]  
b) Explain with diagram, construction and working of Thermocouple. [5]

- Q3)** a) Explain classification of Pressure measuring instruments. [4]  
b) Explain with diagram, construction and working of Bourdon pressure gauge. [6]

OR

- Q4)** a) Explain LVDT as pressure measuring device. [5]  
a) What are different types of manometers? With neat sketch explain inclined leg manometer. [5]

- Q5)** a) Explain with diagram, construction and working of Rota meter with its industrial application. [8]  
b) Explain classification of flow measuring instruments. [8]

OR

- Q6)** a) Explain with diagram, construction and working of ultrasonic level measurement method. [8]  
b) Explain with diagram, construction, working sight or gauge glass method. [8]

**P.T.O.**

**Q7)** Describe with neat diagram the following techniques of composition analysis. **[16]**

- a) Gas chromatography
- b) Mass Spectroscopy

OR

**Q8)** a) Write short notes on: **[8]**

- i) Liquid chromatography
- ii) Refractometry

b) Explain principle with diagram, construction, working of HPLC. **[8]**

**Q9)** a) Give classification of process variable with respect to process control. **[9]**

b) State difference between first order and second order system. **[9]**

OR

**Q10)** a) Derive the transfer function of mercury in glass thermometer and find the dynamic behaviour for step change in input. **[9]**

b) What are servo and regulatory operation? **[9]**

