B.TECH SEM - VI (2007 COURSE) (CHEMICAL ENGG.) : SUMMER - 2018

SUBJECT : PROCESS INSTRUMENTATON AND INSTRUMENTAL METHODS OF ANALYSIS

Day : **Wednesday** | **S-2018-2701** | Time : **02.30 PM TO 05.30 PM**
Date : **06/06/2018** | Max. Marks : 80

N. B. :

1) **Q. No. 1** and **Q. No. 5** are **COMPULSORY**. Out of remaining attempt **ANY TWO** questions from Section – **I** and Section – **II**.
2) Figures to the right indicate **FULL** marks.
3) Answers to both the sections should be written in the **SEPARATE** answer books.
4) Use of non-programmable calculator is **ALLOWED**.
5) Assume suitable data if necessary.

SECTION - I

Q. 1 **a)** Define process instrumentation and explain the need and scope of process instrumentation. **(05)**

b) Give the classification of pressure measuring instrumentation. **(05)**

c) What is the principle of flight displacement sensor? **(04)**

Q. 2 **a)** Show graphically several distinctive static performance characteristics. **(07)**

b) Which device used to store algorithm based problem explain? **(06)**

Q. 3 Discuss construction and working of indicator dilution methods. **(13)**

Q. 4 Explain the following terms:

a) Elaborate the principles of (DCS) Distributed Control System **(04)**

b) Refract meter **(04)**

c) Merits and demerits of Hydraulic controllers. **(05)**

SECTION – II

Q. 5 **a)** Derive equation for dynamic response of first order instruments when it is subjected to step change in input. **(07)**

b) Describe the potentiometer method of the analysis of liquid mixtures. **(07)**

Q. 6 **a)** How many types of electrodes used for measurement of concentration compare it? **(07)**

b) Explain following term: **(06)**

i) EI **iii)** SIMS
ii) CI **iv)** FAB

Q. 7 **a)** Explain with neat diagram and block diagram the temperature control loop for heat exchanger. **(07)**

b) Explain working of feedback controller with the help of block diagram. **(06)**

Q. 8 **a)** Define poles and zeros of a transfer function. How poles and zeros are located on the complex plane, explain with examples. **(07)**

b) Explain the role of different controller in PID controller with mathematically. **(06)**

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