

B.TECH SEM – VII (2007 COURSE) (CHEMICAL ENGG.) :
SUMMER - 2018
SUBJECT: PROCESS DYNAMICS AND CONTROL

Day : **Thursday**
Date : **24/05/2018**

S-2018-2750

Time : **02.30 PM TO 05.30 PM**
Max. Marks: **80**

N. B. :

- 1) **Q.No.1 and Q.No.5 are COMPULSORY.** Out of remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** Marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book
- 4) Assume suitable data if **necessary**.
- 5) Use of non programmable calculator is **allowed**.
- 6) Draw neat diagrams wherever **necessary**.

SECTION I

- Q.1 a)** Give various forcing functions to study the dynamic response of a system? **(05)**
Explain with neat sketch.
- b)** Explain Routh stability criteria in detail. **(05)**
- c)** Write note on Lead and Lag compensation. **(04)**
- Q.2** What are the different forms of process identification? Explain in brief the semilog plot method for modeling. **(13)**
- Q.3 a)** Sketch the root locus for the system having **(09)**
- $$G(s)H(s) = \frac{K}{(s)(s^2+2s+2)}$$
- b)** Draw bode diagram for transportation lag **(04)**
- Q.4 a)** Explain the cohen coon method of controller tuning in detail. **(06)**
- b)** Explain dead time compensation (smith predictor) system with neat block diagram. **(07)**

SECTION - II

- Q.5** Construct Continuous signal for first and second order in which time for 0 to 8T and signal 0 to 5. Prepare appropriate construction and make statement. **(14)**
- Q.6** What is adaptive control system? Discuss **(13)**
- i) Gain Scheduling adaptive control
 - ii) Self tuning regulator
- Q.7 a)** Describe State Space Analysis Method. **(05)**
- b)** Construct a relative gain array and select minimum interaction between the loops for $\lambda_{11} = 0.75$ **(08)**
- Q.8** Differentiate DCS, PLC and SCADA with example. **(13)**

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