

No. of Printed Pages : 03

Roll No.

BB-24

M. Tech. EXAMINATION, May 2017

(Second Semester)

(B. Scheme) (Main & Re-appear)

EE(I&C)

MIC-508-B

NONLINEAR & ADAPTIVE CONTROL

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Section. All questions carry equal marks.

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P.T.O.

Unit I

1. What is describing function ? Derive expression for describing function of dead-zone and saturation non-linearity. **15**
2. (a) Explain the isocline method for construction of phase trajectories. **10**
(b) Explain salient features of non-linear systems. **5**

Unit II

3. (a) Explain Liapunov's direct method of stability. **5**
(b) Describe the stability in Liapunov's sense. **5**
(c) Define positive definite matrix. **5**
4. Explain variable gradient method for construction of Liapunov function for non-linear systems. **15**

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Unit III

5. (a) Explain indirect adaptive control. **5**
(b) Explain basic concept and block diagram of adaptive control system. **10**
6. (a) What is composite adaptive control ? **5**
(b) Explain Model Reference Adaptive control scheme. **10**

Unit IV

7. Explain, how we can use VSC for state estimation of uncertain systems. Give detailed analysis. **15**
8. (a) Define variable structure control. What is chattering in VSC. **8**
(b) How do we design the sliding mode surface ? What are the advantages of VSC ? **7**

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