Roll No. | | | | | | | | | | | | | Total No. of Pages : 01

Total No. of Questions : 8

M.Tech. (Power System) (2018 Batch) (Sem.–2)

ADAPTIVE LEARNING AND CONTROL

Subject Code : MTPS-203C-18

M.Code : 76136

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWELVE marks.**

1. What do you mean by an adaptive control system? Discuss the various types of adaptive control schemes.
2. Explain MIT rule for designing model reference adaptive controller. Draw the block diagram of an MRAS for adjustment of a feedforward gain based on MIT rule.
3. Discuss the properties of Lyapunov's function. Explain Lyapunov's theory for time invariant systems. Also find out Lyapunov function for linear systems.
4. What do you mean by robustness? How can you design robust adaptive controllers?
5. Discuss the advantages of intelligent controllers over conventional controllers. Also explain how neural networks can be used in designing controllers.
6. Explain briefly reinforcement learning based control.
7. Consider a system with the transfer function :

$$G(s) = \frac{k}{s+2}$$

The gain k may change in the range 0.2 to 10. Design a servo using the SOAS principle so that the closed loop transfer function is independent of process gain.

$$G(s) = \frac{1}{s^2+s+1}$$

8. Write a short note on :
   a) Model Predictive Control
   b) Repetitive learning control

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.