Reg. No. | | | | | | | | | |

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

FIRST SEMESTER M.TECH. (CONTROL SYSTEMS)

END SEMESTER DEGREE EXAMINATIONS, NOVEMBER - 2019

SUBJECT: ADAPTIVE CONTROL [ICE 5151]

TIME: 3 HOURS MAX. MARKS: 50

Instructions to candidates :*Answer ALL questions and missing data may be suitably assumed.*

1.A State and describe the Diophantine equation.
1.B Describe open loop adaptive control with the help of a neat diagram.
1.C Derive the expression for generalized minimum variance control law.

(2+3+5)

2.A What is system identification? Differentiate between system identification and system simulation.
2.B How inferential control can be implemented in a distillation column?
2.C Design a general linear controller with 2-degree of freedom using pole placement.

(2+3+5)

3.A Draw the block diagram for implicit MRAC.
3.B Explain the step impulse response based method for identification of dead-time process.
3.C What is model following? Explain with an example.

(2+3+5)

4.A Differentiate between output error model and auto regressive exogenous input model.
4.B Explain how continuous time signals are reconstructed from discrete time values using zero and second order hold.
4.C Derive the expression for recursive plant model identification in closed loop.

(2+3+5)

5.A Draw the computer control loop diagram.
5.B Derive the equations for the discrete time state estimator.
5.C What is the cause of inverse response in a system? How it can be compensated?

(2+3+5)

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