MANIPAL INSTITUTE OF TECHNOLOGY

Reg. No.



MANIPAL (A constituent unit of MAHE, Manipal)

SECOND SEMESTER M.TECH. (CONTROL SYSTEMS) END SEMESTER EXAMINATIONS, APRIL 2018

SUBJECT: ADAPTIVE CONTROL [ICE 5244]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:		
	 Answer ALL the questions 	
	Missing data may be suitably assumed	
1A.	Explain self-tuning regulator with a neat diagram.	4
1B.	Describe Model reference adaptive control.	4
1C.	Explain ARMA model.	2
2A.	Enumerate the procedure to design a controller for a double integrator plant, $p(s) = \frac{1}{s^2}$, using	5
	pole placement technique.	
2B.	Derive Bezout Identity using Euclids algorithm.	3
2C.	Differentiate between conventional control system and adaptive control system.	2
3A.	What is gain scheduling? Explain with an example.	6
3B.	What are the computational steps in the generalized predictive control algorithm?	2
3C.	What is the MIT rule?	2
4A.	Derive the expression for generalized minimum variance control.	5
4B.	Explain discrete-time dynamic output feedback with necessary derivation.	5
5A.	Derive the expression for recursive least square estimate.	4
5B.	Derive the expression for continuous-time observer based state feedback.	4
5C.	Explain Luenberger Observer with necessary derivations.	2