

Code: 9A14701

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2017

MECHATRONIC SYSTEMS

(Mechatronics)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain the development and evolution of mechatronics.
(b) What are the key elements of mechatronics?
- 2 (a) Discuss the objectives of mechatronics in the modern engineering practice.
(b) Differentiate the features between planetary transmission and harmonic transmission.
- 3 (a) Explain the function and the basic principle on which the DC servo motor works.
(b) Explain the following basic elements of DC motor.
(i) Armature.
(ii) Field poles.
(iii) Commutator.
(c) Write short notes on permanent magnet rotor and the variable reluctance type motor.
- 4 Discuss controllers in terms of transfer function and illustrate the type of issues for the basic form of proportional integral derivative controller.
- 5 (a) Represent the standard symbols used in ladder diagrams.
(b) Consider the simple wiring diagram for an electrical circuit to explain ladder programming.
- 6 (a) Explain the various pumps used in hydraulic systems.
(b) Explain the following control valves that control the rate of flow.
(i) Directional control valves.
(ii) Pressure control valves.
(iii) Flow control valves.
- 7 Explain the working phenomenon of single acting and double acting pneumatic cylinder.
- 8 Discuss actuation systems and describe the principle and working of rotary actuator that gives partial rotary movement.
