

Reg. No. :

--	--	--	--	--	--	--	--	--	--

Question Paper Code: 31773

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Seventh Semester

Mechanical Engineering

01UME703 - MECHATRONICS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is a smart sensor? List out its functions.
2. Give the equivalent circuit for a piezoelectric sensor.
3. State the advantages of using DC servo motor in a Mechatronic system.
4. Elucidate the significance of Process control valves.
5. What are the classifications of composite mode electronic controllers?
6. What is meant by adaptive control?
7. List out the features of PLCs which are specific to their use as controllers.
8. Write about the relay?
9. List down the applications of wireless surveillance balloon.
10. What is meant by duty cycle?

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain the terms used to define the performance of a measurement system. (8)
(ii) Explain working principle of a force measuring transducer with a neat diagram. (8)

Or

- (b) (i) List some of the methods of temperature control systems and explain anyone with a sketch. (8)
 - (ii) Analyze the factors to be considered in the selection of sensors for a specific application. (8)
12. (a) (i) What are solid state switches? Illustrate with neat sketch the working principle of TRIAC. (8)
- (ii) Outline the primary functions of mechanical actuation systems. (8)

Or

- (b) Explain the working principle of Brushless permanent magnet DC motor. (16)
13. (a) Discuss briefly model building block for automatic suspension system and electric motor. (16)

Or

- (b) (i) Explain the characteristics of PID controller with a block diagram. (8)
 - (ii) With a block diagram explain the velocity control with feedback system for the movement of a load using suitable controller. (8)
14. (a) (i) List out the factors to be considered for the selection of PLC for an application. (6)
- (ii) Explain the different operations carried out by PLC in data handling. (10)

Or

- (b) (i) Explain in detail about jump control used in PLC using a ladder diagram. (10)
 - (ii) Draw the delay ON and OFF timer ladder diagrams. (6)
15. (a) Discuss in detail, various design factors to be considered while designing a mobile robot? (16)

Or

- (b) List out the various sensors used in Engine management system and explain the design of a Mechatronic system used in Engine management system? (16)
-