

Reg. No. :

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R 3488

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Sixth Semester

Mechatronics Engineering

MH 1353 — DESIGN OF MECHATRONICS SYSTEM

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A -- (10 × 2 = 20 marks)

1. What are the technologies involved in mechatronics systems?
2. Explain man machine interface in manufacturing environment.
3. What is data acquisition?
4. How are analog signals processed?
5. What is the principle of strain gauge transducer?
6. What is a solenoid?
7. What is skip control of CD player?
8. What is the sensor used for autofocus?
9. What is condition monitoring?
10. Give two applications of fuzzy logic in mechatronics.

PART B — (5 × 16 = 80 marks)

11. (a) (i) What are the application of a mechatronics system? What are its merits and demerits? (8)
- (ii) Explain the role of modeling and simulation in the analysis of mechatronic systems. (8)

Or

- (b) (i) Compare the traditional types of design and mechatronic designs with two examples. (8)
- (ii) What safety measures are to be taken in an automated manufacturing environment? (8)
12. (a) (i) Explain the working of a position control of dc motor with tacho generator. (8)
- (ii) Explain the adaptive control system for machining. (8)

Or

- (b) (i) Compare the merits and demerits of hydraulic actuators and electrical actuators. (8)
- (ii) Explain the static and dynamic calibration of a transducer. (8)
13. (a) (i) Explain with a diagram the cantilever beam force measurement system. (8)
- (ii) How is a rotary optical encoder used in a CNC machine? Explain with a diagram. (8)

Or

- (b) Explain the following terms :
- (i) over framing
- (ii) integration algorithm
- (iii) displacement calibration.
14. (a) Discuss with neat sketches the following mechatronic systems.
- (i) washing machine control through sequence control system. (8)
- (ii) temperature control of cold/hot reservoir. (8)

Or

- (b) Design a pick and place robot using PLC and hydraulic actuation. (16)

15. (a) How is mechatronics used to control advanced manufacturing systems like FMS? Discuss in detail. (16)

Or

- (b) What are the sensors that can be used in the condition monitoring of a drilling machine? Discuss the arrangement with details.
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