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10MAR14

First Semester M.Tech. Degree Examination, January 2011
Industrial Automation

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions.***
2. Draw neat sketches, wherever necessary.

1 a. Define automation. Explain the various strategies for automation and production systems. **(12 Marks)**
b. Describe the error detection and error recovery functions of advanced automation. **(08 Marks)**

2 a. Explain the ten principles of material handling. **(10 Marks)**
b. Describe the principle used in self guided vehicle technology. **(04 Marks)**
c. What are the reasons that justify the installation of automated storage systems for work in process? Discuss. **(06 Marks)**

3 a. Explain the types of bar code readers. **(06 Marks)**
b. Write a note on radio frequency identification. **(06 Marks)**
c. Describe the various conveyors driven by chains and cables. **(08 Marks)**

4 a. What is production flow analysis? Discuss the steps involved in PFA procedure. **(10 Marks)**
b. What are the functions of a FMS computer control system? Explain. **(10 Marks)**

5 a. Explain the following mechanical structures used in CMM construction, with neat sketches : i) Horizontal arm ; ii) Gantry type. **(08 Marks)**
b. Write a note on the types of non contact, non-optical inspection techniques. **(06 Marks)**
c. Discuss the applications of machine vision. **(06 Marks)**

6 a. Write a note on interlocks and interrupt systems. **(06 Marks)**
b. Draw the block diagram of a DDC system and explain its features in comparison with an analog control system. **(06 Marks)**
c. With help of a neat block diagram, explain the adaptive control system. **(08 Marks)**

7 a. Explain the analog input module, with the help of schematic block diagrams. **(08 Marks)**
b. Describe the special software facilities required in RTUs that are not available in SCADA. **(06 Marks)**
c. Discuss the polling process in SCADA. **(06 Marks)**

8 a. Explain control bailey micro – Z system, with help of a block diagram. **(08 Marks)**
b. What is the necessity of modeling and simulating a plant for automation? What are the steps in building the mathematical model of a plant? Discuss. **(06 Marks)**
c. Write a note on future perspectives in modeling and simulation and application examples for plant automation. **(06 Marks)**

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