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THE OPEN UNIVERSITY OF SRI LANKA

FACULTY OF ENGINEERING TECHNOLOGY

BACHELOR OFINDUSTRIAL STUDIES– LEVEL 06

FINAL EXAMINATION –2010

LIBRARY
01 NOV 2011
The Open University of Sri Lanka

MEX6351 – INDUSTRIAL AUTOMATION

DATE : ***31 MARCH 2011***
TIME : ***1400HRS -1700HRS***
DURATION : ***THREE HOURS***

PLEASE READ THE FOLLOWING INSTRUCTIONS BEFORE ANSWERING THE PAPER

INSTRUCTIONS:

1. *This paper consists of eight questions. Answer any **five questions only.***
2. *Each question carries equal marks.*
3. *Answers should be written on the answer books provided by the Examinations Division.*
4. *Commence to answer each question on a **fresh page***

Question 01

(1.1) Distinguish industrial automation from factory automation.

(1.2) Discuss the applicability of automation in industry.Take appropriate examples to elaborate your answer.

(1.3) What are the implications of inappropriate applications of automation within an industry? Give examples to clarify your answer.

Question 02

(2.1) Explain the different types of industrial plants in manufacturing industry. Give examples for each.

(2.2) What are the types of automation best suited for the types of plants discussed in (2.1) above. Justify your answer.

(2.3) Distinguish between the structure and the hierarchy of an industrial automated plant.

Question 03

(3.1) *Instrumentation systems play a major role in industrial automation*. Draw an arrangement of such a system and comment on the statement.

(3.2) Discuss the importance of sensing in industrial automation.

(3.3) Taking suitable examples explain the difference between active and passive sensors.

Question 04

(4.1) What are the factors that you would consider in selecting a sensor for a particular application? Explain by taking an appropriate example.

(4.2) Briefly describe at least five (05) static characteristics of sensors used in instrumentation systems.

(4.3) Describe the operation and applicability of inductive type and capacitive type proximity sensors.

Question 05

(5.1) Explain the significant role played by industrial communication systems in industrial automation.

(5.2) Briefly describe the levels of communication systems within a large scale industrial plant.

(5.3) Discuss the operation and advantages offered by ASI bus employed at device level within an industrial communication system.

Question 06

(6.1) Distinguish between open-loop and closed-loop control systems. Elaborate on your answer by taking suitable examples for the industry.

(6.2) Illustrate the different levels of the control system hierarchy in a large scale automated plant. State clearly the relationship among the various levels, response times and the complexity within its respective levels.

(6.3) Taking suitable examples, explain the main application areas of control in industry.

Question 07

(7.1) Write down a definition for a Robot. What makes a robot different from other forms of automated devices?

(7.2) What distinguishes anthropomorphic robots from other forms of robots? Give examples and applications of such type of robots.

(7.3) Discuss the importance of industrial robots in industrial automation.

Question 08

Write brief notes on any four (04) of the topics given below.

(i) SCADA systems.
(ii) DeviceNet standard.
(iii) Evolution of automation.
(iv) Industrial actuation systems.
(v) Resistive Temperature Detector.
(vi) Dynamic characteristics of sensors.

~ END ~

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