[Total No. of Questions - 8] [Total No. of Printed Pages - 2]
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M. Tech 3rd Semester Examination

Mechatronics

PEE-E19

Time : 3 Hours Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt any five questions.

1. (a) With a block diagram, briefly explain the generalized measurement system. (8)

   (b) Define microprocessor-based controllers. Explain with a block diagram the working of an engine management system. (12)

2. Derive the motor equation for 4 phase PM stepper motor and construct the block diagram. (20)

3. Draw the mechanical diagram of automobile suspension system. Determine the transfer function of the system. (20)

4. (a) Explain major components of Data Acquisition and control system. (10)

   (b) Explain needs of PID controller with any one application and justification. (10)

5. A battling plant uses an automated mechanism for filling the containers and transporting them from one point to another as shown in figure. A sensors monitor the amount of solid or liquid

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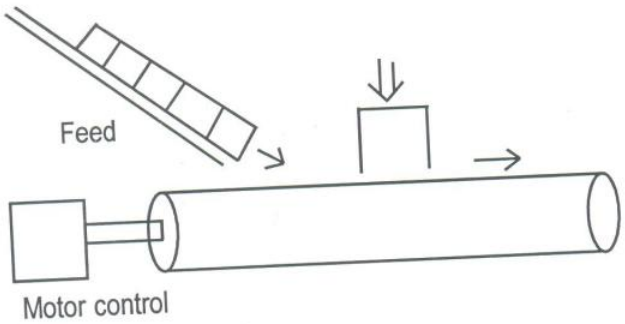
filled a conveyer mechanism to transport the containers, design a mechatronics system with the help of PLC, the case identify the types of sensor you used, explain how interface control system work. (20)



6. Explain with the block diagram, how a microprocessor control system is used to control the focussing and exposure in an automatic camera. (20)

7. Derive a mathematical model for a spring mass damper system. (20)

8. Write short note on following:

   (i) Difference between micprocessor and microcontroller.

   (ii) Difference between PLC & Relay logic.

   (iii) Difference between measurement system & control system. (20)