

Code No: 07A72201

R07

Set No. 2

IV B.Tech I Semester Examinations, MAY 2011
PC BASED INSTRUMENTATION
Electronics And Instrumentation Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. Draw and explain different levels of PLC networking layers. [16]
2. Describe the essential features to be considered when selecting a language for software development in PC based instrumentation and control application. [16]
3. (a) What is a field bus?
(b) Explain the operation of field bus with a neat diagram. [6+10]
4. Explain the function of each block of a Data Acquisition and control card with the help of a block diagram. [16]
5. Explain the PLC MOVE function and its applications. [16]
6. Discuss how Solenoids are interfaced and controlled by PLC. [16]
7. Explain Boolean algebra programming of a PLC with an example. [16]
8. With suitable circuit diagrams explain how to activate a TRIAC circuits for [16]
 - (a) lamp drive
 - (b) resistance load and
 - (c) inductive load. [5+5+6]

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R07**Set No. 4**

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Electronics And Instrumentation Engineering

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
 All Questions carry equal marks

1. Explain the following high level languages of a PLC.
 - (a) Instruction List
 - (b) Structured text
 - (c) Function Block diagram.
 - (d) Sequential function chart. [4 × 4]
2. How does a PLC is used as a PID controller? Explain clearly with an example. [16]
3. Discuss the function of various transducers and sensors, and explain emphasizing how they are interfaced to PLC CPU. [16]
4. (a) What are remote I/O modules used in data acquisition and control? Explain with a diagram.
 (b) What is meant by configuring an add on card? [10+6]
5. (a) What are Include files in C and C ++ programming?
 (b) What are the important Include files with the C run time library ? What are their Contents, give one example for each file? [6+10]
6. Draw and explain the ladder diagram to represent:
 - (a) A light is to come on if there is no input to a sensor.
 - (b) A motor is switches on by pressing a spring return push button start switch and the motor remains on until another spring return push button stop switch is pressed. [8+8]
7. Explain the following PLC Matrix functions.
 - (a) AND and OR matrix functions
 - (b) Complement and compare matrix functions. [8+8]
8. What is a snubber circuit? How do we protect solid state relays from DC transients and AC transients. [16]

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Set No. 1

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1. Explain the basic types of the PLC timer functions. [16]
2. Explain the characteristics of a PID controller with necessary response curves. [16]
3. Explain HART protocol operation with a neat block diagram. [16]
4. Discuss basic input on/off switching systems in a PLC. [16]
5. (a) What is an I/O function in C programming?
(b) Describe the three types of I/O functions available within C. What do they contain. Give examples. [4+12]
6. (a) Explain current loop in a data Acquisition and control.
(b) What is an opto coupler and where is it used in data acquisition and control? [8+8]
7. Draw and explain the PLC ladder diagram for the following problem:
A work piece is loaded on a conveyor belt and operates between two limits of travel. When limit switch LS_2 is activated, the belt moves forward. When LS_1 is activated, the belt changes direction. Pressing the start button causes the motor to run in the forward direction, and pressing the stop button stops the motor. [16]
8. Describe the supply rail distribution precautions to be taken in the design and layout of prototype expansion boards. [16]

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R07**Set No. 3**

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1. Write short notes on the following: [8+8]
 - (a) HART protocol operation.
 - (b) Smart actuators.
2. Explain the programming of ON - OFF outputs of a PLC. [16]
3. Discuss the function of relays, solenoids, Pneumatic and Hydraulic cylinders. [16]
4. Explain analog operation a PLC with examples. [16]
5. What is MS-DOS debugger? Describe the function of each of the Debugger commands. [16]
6. Explain the following signal conditioning circuits in data acquisition boards [4×4=16]
 - (a) Data logger
 - (b) PC-plug-ins
 - (c) Computer back plane PC plug-ins
 - (d) Network based systems.
7. Design and construct a PLC circuits for the following processes.
 - (a) An indicating light is to go on when a count reaches 23. The light is then to go off when a counter of 31 is reached.
 - (b) A machine, M, is to be turned on either when count 'A' goes up to 11 or when count 'B' goes up to 16. One stop button resets the entire process. [8+8]
8. Explain in detail with the help of diagrams different driving circuits used for interfacing digital output signals. [16]
