Code No: RR422201 **Set No. 1**

IV B.Tech II Semester Regular Examinations, Apr/May 2006
INSTRUMENTATION AND CONTROL IN MANUFACTURING SYSTEMS
(Instrumentation & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Show the ORS Tool angles with the help of a neat sketch?
   (b) Explain the relationship between ASA and ORS of Tool angles? [8+8]
2. (a) Define numerical control and state its basic principles?
   (b) What are the basic components of numerical control? [6+10]
3. Differentiate between CAD, CAM and CIM? [16]
4. What are the functions that are performed by the FMS computer control system? [16]
5. Explain the different techniques for finding the inverse kinematics for any manipulator? [16]
6. With neat sketches explain different types of positive displacement meters? [16]
7. A temperature alarm unit with a time constant of 2 min is subjected to a sudden 60^o C rise in temperature because of a fire. If an increase of 40^o C is required to actuate the alarm, what will be the delay in signaling the sudden temperature increase? [16]
8. Explain the following
   (a) Moving iron.
   (b) Moving coil.
   (c) Moving magnet. [6+5+5]

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Code No: RR422201 **Set No. 2**

IV B.Tech II Semester Regular Examinations, Apr/May 2006
INSTRUMENTATION AND CONTROL IN MANUFACTURING SYSTEMS
(Instrumentation & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Differentiate between age hardening and precipitation hardening? What is artificial aging? [16]
2. Discuss the various types of interpolation schemes of an NC system. [16]
3. (a) Describe the configuration of automated flow line?
   (b) Sketch the configuration of a rotary indexing machine? [8+8]
4. (a) Define FMS? What are the components of FMS?
   (b) How many Types of FMS are there? Explain them? [6+10]
5. Explain with the help of neat sketches five commonly used kinematic configurations for Robot arms? [16]
6. (a) Explain the various Psychoacoustic relationship?
   (b) List out the various sound-measuring apparatus? [8+8]
7. Explain with a neat sketch, working of an optical pyrometer. What are its advantages and limitations? [16]
8. Describe the classification of first stage devices with neat sketches? [16]

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Code No: RR422201 **Set No. 3**

IV B.Tech II Semester Regular Examinations, Apr/May 2006
INSTRUMENTATION AND CONTROL IN MANUFACTURING SYSTEMS
(Instrumentation & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Sketch and Explain any two methods of metal machining? [16]
2. Explain the types of NC systems with diagrams? [16]
3. (a) Describe the configuration of automated flow line?
   (b) Sketch the configuration of a rotary indexing machine? [8+8]
4. (a) Define FMS? What are the components of FMS?
   (b) How many Types of FMS are there? Explain them? [6+10]
5. Distinguish clearly between forward Newton-Euler equations and backward Newton Euler equations, with a simple example? [16]
6. (a) Explain the working of photovoltaic Transducer with a neat sketch?
   (b) A piezo - electric crystal having the dimensions, of 5mm x 5mm x 1.5mm.thick and a voltage sensitivity of 0.05 vm/N is used for force measurement. What force should be applied to develop an output voltage of 100v? [10+6]
7. (a) What is pyrometry? With a neat sketch, explain the working of a total radiation pyrometer?
   (b) What are the advantages and limitations of total radiation pyrometer? [8+8]
8. List out the various operations performed by primary detector- transducer elements? [16]

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Code No: RR422201 **Set No. 4**

IV B.Tech II Semester Regular Examinations, Apr/May 2006
INSTRUMENTATION AND CONTROL IN MANUFACTURING SYSTEMS
(Instrumentation & Control Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Describe the following:
   (a) Rubber press forming.
   (b) Rubber hydro forming. [8+8]
2. (a) Define numerical control and state its basic principles?
   (b) What are the basic components of numerical control? [6+10]
3. Differentiate between CAD, CAM and CIM? [16]
4. Define the following terms with reference to Robots?
   (a) Work envelope.
   (b) Work cell.
   (c) Tip speed.
   (d) Co-ordinate motion. [4+4+4+4]
5. (a) Explain homogeneous co-ordinate system and homogeneous transfarunations used in motion analysis?
   (b) Distinguish between the forward solution and inverse solution of solving kinematics problems and forward solution method in detail? [8+8]
6. Discuss the following
   (a) Piezoelectric Transducer
   (b) Capacitive Transducer
   (c) Ionization Transducer
   (d) Cylindrical Capacitive Transducer. [4+4+4+4]
7. A liquid seal is used with a pressure guage so that the sealing liquid surface is 1m below the pressure tap and 2.2m above the guage. Water condenses above the sealing liquid, which has a specific gravity of 2.09 What is the static error of the guage, if the guage calibration made with air is correct? [16]
8. How many types of resistance potentiometers are their explain them with neat sketches. [16]

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