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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

First Semester, M. Tech - Mechanical Engineering (MCIM)

Semester End Examination; Jan - 2017

Computer Control of Manufacturing Systems

Time: 3 hrs

Max. Marks: 100

Note: Answer *FIVE* full questions, selecting *ONE* full question from each unit.

UNIT - I

- 1 a. Explain the requirements of a control computer. 10
- b. Explain levels of automation with a block diagram. 10
- 2 a. With a simple diagram, explain computer process monitoring. Explain the classification of data collected by the computer. 10
- b. Explain DDC and supervisory control. 10

UNIT - II

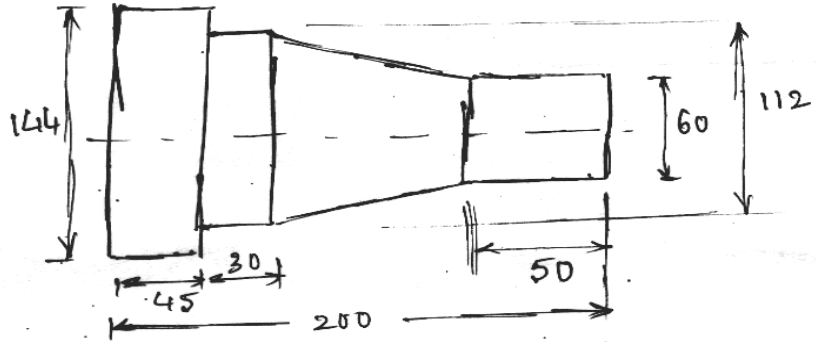
- 3 a. Write the advantages and disadvantages of NC. 10
- b. Explain : 10
 - i) Absolute and Incremental systems
 - ii) Machining centre features.
- 4 a. With a block diagram, explain incremental closed-loop control of NC system. 10
- b. Explain the following feedback devices : 10
 - i) Encoders
 - ii) Resolvers.

UNIT - III

- 5 a. Explain travelling column vertical machining center with a schematic diagram. 10
- b. Explain : 10
 - i) Twin turret turning centres
 - ii) Multiple spindle turning centres.
- 6 a. With a simple sketch, write the sequences of events for tool changing in case of a double gripper. 10
- b. Explain milling tool assembly with a sketch. 10

UNIT - IV

- 7 a. Explain the steps involved in the development of a part program. 10
- b. Explain the following with respect to CNC programming : 10
 - i) Canned cycles
 - ii) Preparatory functions
 - iii) Cutter Radius compensation
 - iv) Modal functions.
- 8 a. Compare between turning centres and machining centres programming. 10
- b. The following component is to be made using a CNC turning centre. Prepare the part program to completely machine the parts from rolled stock. Clearly show the set point and axes on the sketch of the part. Assume required data suitably. 10



All dimensions are in mm

UNIT - V

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| 9 a. | Explain the principal structure of a digital computer with a sketch. | 10 |
| b. | With a block diagram, explain reference-pulse CNC system. | 10 |
| 10 a. | Explain ACO system for a milling machine with a block diagram. | 10 |
| b. | Explain ACC system for turning with a block diagram. | 10 |

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