Total No. of Questions : 5] *[Total No. of Printed Pages : 2*

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IP/IEM/ME/PR-603

B.E. VI Semester

Examination, December 2016

Metal Cutting and CNC Machines

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
iv) Except Numericals, Derivation, Design and Drawing etc.

Unit-I

1. a) What do you mean by lathe machine?
   b) Classify different types of lathe.
   c) Distinguish between driving plate and mandrel.
   d) Calculate the machining time required to reduce from 60mm dia shaft to 50mm diameter for a length of 1500mm with depth of cut 2mm for rough cut and 1mm for finish cut. Cutting speed and feed are 30m/min and 0.5mm/rev. respectively.

   OR

   A workpiece of 100mm in diameter is to be turned in a lathe machine. What will be the r.p.m. of head stock spindle to attend a cutting speed of 25m/min?

Unit-II

2. a) What do you mean by abrasive?
   b) Enlist the points to be considered in selecting a grinding wheel?
   c) Explain the steps to be followed in finishing an external surface by cylindrical grinder?

   d) Calculate the r.p.m. of the workpiece of diameter 50mm and the peripheral speed of 14m/min.

   OR

   Calculate the machining time for surface grinding for plate of 600mm length. The grinding allowance of 0.5mm has to be ground down with 3 cuts. Speed of the table is 2m/min.

Unit-III

3. a) Classify the drilling machine.
   b) Write the advantages of using spiral flutes (twist) drill instead of using straight flutes.
   c) Designate a drill bit and explain its different parameters.
   d) Sketch, state and compare up-milling and down-milling.

   OR

   Calculate the machining time to broach a hole on a m.s. job with length of broach = 0.8m and cutting speed of 2m/min.

Unit-IV

4. a) Enlist the main parts of a shaping machine.
   b) Specify a shaping machine.
   c) Sketch left hand and right hand shaping tool.
   d) Find the time required on a shaping machine for complete one cut only on a plate of 200mm × 300mm, if the cutting speed is 15m/min. The return time to cutting time ratio is 2:3 and the feed is 2.5mm. The clearance at each end is 40mm.

   OR

   Explain the process of Die casting for generating gears.

Unit-V

5. a) Define the term transfer function.
   b) What is analog control?
   c) What is servo mechanism?
   d) Briefly explain the working of PLC.

   OR

   Briefly classify CNC machines. Enlist its advantages.

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