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c) Discuss advantages of transducers.

d) What is an automatic control system? What are its advantages and applications?

OR

Briefly discuss the classification of CNC machines?

Total No. of Questions : 5]

[Total No. of Printed Pages :4

Roll No

IP/IEM/ME/PR - 603

B.E. VI Semester

Examination, December 2015

Metal Cutting and CNC Machine

Time : Three Hours

Maximum Marks : 70

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Note: i) Answer 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) Write the principles of operation in lathe machine.

b) Distinguish between steady rest and follower rest.

c) State the function of a lathe centre, sketch and show the elements of a centre.

d) 1 mm pitch screw thread (Internal) is to be cut in a centre lathe having a 6.T.P.I. lead screw. Calculate gearing arrangements for driver and driven assuming usual quadrant restrictions and change gears availability.

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OR

1.5 mm pitch threads are to be cut by a lathe machine on 30 mm diameter M.S. rod at a cutting speed of 9 m/min to a length 200 mm. Calculate the thread cutting time.

Unit - II

2. a) Enlist the composition of a grinding wheel?
- b) Enlist the advantages of grinding machine over other conventional machining processes.
- c) State about the term speed, feed and depth of cut used in grinding operations.
- d) Compare between centreless grinding and cylindrical grinding?

OR

Calculate the wheel speed of a shaft with a diameter of 100 mm which is to be grinded. Assume peripheral speed of the work piece as 15 m/min.

Unit - III

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3. a) Write the advantages of using a Broaching machine.
- b) Name the operations that may be performed by a Broaching machine.
- c) Sketch and write the steps to be followed in spur gear milling.

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- d) Calculate the feed/revolution to drill a hole of 20 mm in one minute to a plate thickness of 30 mm and using a spindle speed of 500 r.p.m.

OR

Compare between plain milling and universal milling machines.

Unit - IV

4. a) Specify a shaping machine.
- b) Sketch quick return mechanism adopted in a shaping machine.
- c) Explain the process of gear shaving.
- d) Calculate the machining time required for taking a complete cut by two rough cuts and one finish out on a grey C.I. Plate 800 mm × 600 mm, cutting speed = 12 m/min, return/cutting time ratio = 2:3, feed = 1.5 mm/cycle, allowances length-wise = 20 mm, allowances width-wise = 5 mm

OR

Write step by step how you will calculate the machining time of a flat surface in a shaping machine.

Unit - V

5. a) What is signal flow diagram?
- ~~b) Enlist the steps for writing transfer function.~~
- ~~c) Discuss advantages of transducers.~~