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College of Engineering, Pune
End Semester Examination MAY 2013

Course: B.Tech (Production Engineering) Semester IV
Machining Science and Technology

Date: / / 2013
Time:

Duration: Three hours
Max Marks: 50

Instructions

1. All questions are compulsory.
2. Neat diagrams must be drawn wherever necessary.
3. Black figures to the right indicate full marks
4. Use of Calculator is allowed
5. Assume suitable data, if necessary.

- Q1 (A) Answer the following. (Any two) [6]
1. What is metal cutting? Define chip removal and non chip removal process with examples.
 2. Define tool signature.
 3. Explain the relationship between various forces in orthogonal cutting.
- (B) Determine the time required to turn a brass component 50 mm diameter and 100 mm long at a cutting speed of 36 m/min. the feed is 0.4 mm/revolution and only one cut is taken. [4]
- OR
- A mild steel bar is turned with HSS tool. Determine the tool life for a cutting velocity of 40 m/min, if the tool life equation is $V T^{0.2} = 80$
Also determine how many components may be turned before regrinding the tool.
- Q2 (A) Explain the following (Any two) [6]
1. Various types of chip breakers.
 2. Selection of number of teeth on a milling cutter.
 3. How the pitch of teeth of a broach is selected?
- (B) Draw a sketch of broach showing different portions and explain design procedure of it. [4]
- OR
- Discuss various types of reamers. Explain the design features of a reamer.
- Q3 (A) Answer the following (Any five) [10]
1. What is the principle of Merchant's model for determining shear plane angle in orthogonal cutting?
 2. Discuss various types of tool wear.
 3. Draw a sketch of twist drill and explain nomenclature of it.
 4. What are types of broaching machines? Explain.
 5. What are various cutting tool materials? Explain.
 6. How grinding wheels are classified?
 7. Explain design procedure for form tool.

Q4 (A) Explain the method of cutting gears by hobbing. Describe advantages and disadvantages of it. [6]

OR

With suitable sketch describe the process of Thread rolling. Give advantages of it.

(B) Answer the following. (any one) [4]

1. Discuss various gear finishing operations.
2. Discuss casting method for production of threads.

Q5 (A) Answer the following. (Any one) [6]

1. Describe with neat sketch working of Electric Discharge Machining (EDM). List advantages and disadvantages of it.

2. Describe with neat sketch construction and working of Laser beam Machining (LBM). List advantages and disadvantages of it. Also state applications of it.

(B) Answer the following. (Any one) [4]

1. Why testing of Machine tool is essential? Explain.
2. Describe steps involved in preventive Maintenance of Lathe machine.

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