Code No: NR222002 **NR**

II B.Tech II Semester Supplementary Examinations, April/May 2005
MACHINE TOOL ENGINEERING
(Production Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain inter relationship between tool angles for A S A system and tool reference system.
   (b) Draw merchant's force diagram and derive velocity relationship and shearing.

2. (a) What is machinability? Explain various criteria for machinability?
   (b) When machining steel with H S S tools, following equation was found to fit the tool life data fairly well
   $VT^{0.15}f^{0.78}d^{0.35} = 243.5$
   Where v= cutting speed in m/min; T = tool life in min; f = feed in mm/rev^n and d = depth of cut in mm. What is the expected tool life at a cutting speed = 25m/min; feed = 0.30 mm/rev and depth of cut = 2.5 mm. Also calculate the effect of 15%increase in each of the above parameters.
      i. made separately and
      ii. made in all of them simultaneously.

3. (a) How will you cut metric threads on a lead screw having English threads and vice versa?
   (b) Describe the different methods of feeding the tool in screw cutting.
   (c) Calculate the change gears for cutting L-H threads of 2 mm pitch on a lathe having lead screw of 6 mm pitch.

4. (a) Explain with a neat sketch the turret indexing mechanism? What are the different types of turret lathe machines?
   (b) What are the Box tools? Describe with sketch a roller steady box tool for turning.

5. (a) What are the different mechanisms used for driving the ram of a slotting machine?
   (b) Describe, with the help of a suitable diagram, the principal parts of a shaper.

6. (a) Sketch the geometry of a twist drill and explain the influence of drill angles on its performance.
   (b) What is boring? What different types of boring tools you know? Describe?

7. (a) Explain the following milling machines:
      i. planetary milling machine

ii. profile milling machine
iii. Pantograph milling machine

(b) Explain the effect of various angles on a plain milling cutter tooth with the help of a neat sketch.

(c) Define the terms 'cutting speed' and 'feed' as applied to milling cutters. How do you calculate the cutting speed of a milling cutter?

8. (a) Explain the following milling machines:
   i. planetary milling machine
   ii. profile milling machine
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   (b) Explain the effect of various angles on a plain milling cutter tooth with the help of a neat sketch.

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