



FACULTY OF ENGINEERING
B.E. 3/4 (Prod.) I Semester (Main) Examination, December 2010
MACHINE TOOL ENGINEERING

Time : 3 Hours]

[Max. Marks : 75

Note : Answer all questions from Part – A, Answer any five questions from Part – B.

PART – A

(25 Marks)

1. What is tool signature ? 2
2. Indicate the heat generation zones in an orthogonal metal cutting process. 2
3. Mention the ISO tool wear criteria. 2
4. Differentiate thread rolling and thread cutting operations. 2
5. What is a multi-spindle automat ? 3
6. How the shaping time is evaluated ? 3
7. Sketch 'Profile' and 'Double angular' milling cutters. 3
8. What are 'Counter sinking' and 'Counter boring' operations ? 3
9. How an abrasive wheel is specified ? 3
10. Define 'Grinding Ratio'. 2



PART – B

(50 Marks)

11. a) Discuss the effect of rake angle on metal cutting and chip formation. Where and why negative rakes are used ? 6
b) Mention salient features in the design of multipoint cutting tools. 4
12. a) Explain the occurrence of 'shear zone' in metal cutting. Which cutting parameters do control shear zone ? 6
b) Discuss the effect of tool wear on machining and machined surface. 4
13. a) With an example explain how tool layout is prepared on a turret lathe. 5
b) Calculate the metal removal rate for turning a 60 mm diameter bar at 190 rpm with 0.2 mm/rev. of feed and 2 mm depth of cut. 5
14. a) With a neat sketch explain the principle of one of the quick return mechanisms in a planer. 6
b) How Gears are shaped ? 4
15. a) Sketch a vertical milling machine showing all the mechanisms. How the job is held on the work table of this machine ? 6
b) Explain the process of Gear Hobbing. 4
16. a) Compare shaping, planning and slotting operations with regard to tool-work motion, types of jobs, applications, etc. 6
b) How a grinding wheel is selected ? 4
17. a) Describe 'on - center' and 'off - centre' internal centreless grinding processes. 6
b) How grinding wheels are manufactured ? 4