Code No. : 5197/M

FACULTY OF ENGINEERING
B.E. 3/4 (Mech.) II Semester (Main) Examination, May/June 2012
METAL CUTTING AND 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 **(Marks : 2.5×10=25)**

1. What is BUE and explain its stability ?
2. What cutting fluids are used in parting knurling, milling and grinding ?
3. What is the composition of HSS and explain the importance of various materials ?
4. Distinguish between up-milling and down milling.
5. How the grinding wheels are selected ?
6. Differentiate between ray diagram and structural diagram.
7. What are the advantages of CNC machining ?
8. Sketch and explain the working principle of LBM.
9. Sketch tapping and spot facing.
10. Sketch and explain wear mechanism.

PART – B **(Marks : 10×5=50)**

11. a) Sketch a single point cutting tool and indicate angles as per ORS system.
    b) Explain the importance of clearance angle, rake angle and secondary plan approach angle.
12. a) Derive Merchant's shear angle solution and indicate the assumptions made.
    b) Differentiate between orthogonal and oblique cutting.

13. a) Derive an equation for the estimation of forces in turning.

    b) What are the various taper turning methods used in practice and explain their advantages and limitations ?

14. a) Derive an equation for tool-life for minimum cost.

    b) Sketch explain Quick-return mechanism used on shaper.

15. a) How the heat is generated in metal cutting and describe various methods used to find the chip-tool, interface temperature ?

    b) How the grinding wheel is specified and explain about abrasives and bond ?

16. a) Sketch the working principle of burnishing and mention its superiority over other finishing processes.

    b) Describe with neat sketches the working mechanism of Box Jig and indexing Jig.

17. Answer the following :

    a) Laser beam machining

    b) Milling fixture.

    c) Gear shaping and Gear hobbing.
