Code No. 6175 / O

FACULTY OF ENGINEERING

B. E. 3/4 (Mechanical) II-Semester (**Old**) Examination, December 2009/Jan., 2010

Subject : **Metal Cutting & Machine Tool Engineering**

Time : 3 Hours Max. Marks: 75

Note: Answer all questions of Part-A and any **Five** questions from Part-B.

Part – A (10 x 2.5 = 25 Marks)

1. State composition and applications of HSS, coated carbides and diamond.
2. Sketch Merchant's circle diagram. Indicate all angles and forces.
3. How do you measure chip-tool interface temperature by thermo-couple method?
4. Define machinability. How metals are rated?
5. Differentiate between shaper, planer and slotter.
6. How do you specify a grinding wheel? Give an example.
7. Differentiate between honing and burnishing.
8. Compare gear shaving and geat hobbing operations.
9. What are the advantages and disadvantages of LBM?
10. What are different types of quick clamping devices used in metal cutting?

Part – B (5 x 10 = 50 Marks)

11.a) What are the differences between orthogonal cutting and oblique cutting? Explain. 3

b) In orthogonal metal cutting operation for mild steel, if the speed is 1.25 mm/rev and chip thickness after curring is 2mm determine the Following when rake angle is 10^0 : 7
   i) Chip thinckness ratio
   ii) Shear angle

   When the shear strength is 6000 kg/cm^2, width of cut = 10mm; cutting speed = 30 m/min, coefficient of friction = 0.9. Determine

   iii) Shear force and friction angle
   iv) Cutting force
   v) Horse Power

12.a) What is tool life? Discuss the factors which affect tool life. 5

b) A tool lilfe of 80 minute is obtained at a speed of 30 m.p.m. and 8 minute at 60 m.p.m. Determine the following : 5
   i) Tool life equation
   ii) Cutting speed for 4 minute tool life

13.a) Draw the neat sketch of horizontal milling machine? Explain the function of Its parts. 5

b) What is indexing? Explain.
A gear is to cut 14 teeth on a milling machine by indexing with the help of DP cutter. What is the indexing movement required? 5

14.a) How thread chasing is done on a lathe machine? Explain. 5

b) Explain the process of gear shaping. 5

15.a) How Electro Discharge machining is carried out? Explain. 5

b) Explain with neat sketch the working principle of ECM. 5

16. Exlain the following : 10
a) Maching cetres
b) Broaching
c) Thread rolling

17. Write short notes on any **TWO** of the following : 10
a) Lapping and Buffing
b) Temperature measurement by pyrometer technique
c) Various types of chips

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