Roll No .....

MMCM - 102

M.E./M. Tech., I Semester

Examination, June 2014

Advances in Manufacturing Technology

Time : Three Hours

Max. Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. In an orthogonal cutting operation on a copper work piece following data has been obtained.

   Back rake angle = 20°

   Chip thickness before cutting = 0.12mm

   Width of chip before cutting = 3.75 mm

   Width of chip after cutting = 4.1 mm

   Chip length before cutting = 130 mm

   Chip length after cutting = 50 mm

   Shear stress of work material = 20 kg/mm^2

   Co-efficient of friction = 0.55

   Cutting speed = 30 mpm

   Determine the forces and power consumption

2. During straight turning of a 25 mm diameter steel bar at 300 r.p.m. with a HSS tool, a tool life of 10 min was obtained. When the same bar was turned at 250 r.p.m., the tool life increased to 52.5 min. What will be the tool life at a speed of 275 r.p.m.?

3. In a conventional twist drill, the point and helix angles are 210° and 30°, respectively. If the chisel edge diameter is 4mm and the drill diameter is 25mm, calculate the minimum and maximum normal rake angle α_n at the lips.

4. a) With the help of neat sketch explain the working principle of USM?
   b) Explain the functions of a "horn" in USM?

5. a) What are the functions of an adaptive control system used for EDM?
   b) Explain the working principle of wire EDM? Also explain how the stratified wire works?

6. a) Derive an equation for the maximum permissible feed rate during ECM. Also deduce the relationship for electrolyte temperature change for a given feed rate of tool.
   b) Write the specific applications of laser beam machining?

7. a) What are the fundamental principles used in the stereo lithography process?
   b) What kinds of material property can be expected from a part built using LOM process?

8. Write short notes on:
   a) Expert systems in manufacturing
   b) Vacuum casting
   c) Selective laser sintering
   d) Water jet machining

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