

**FACULTY OF ENGINEERING**

B. E. 4/4 (Mech. / Prod.) I – Semester (Old) Examination, July 2010

Subject : **Tool Design**  
(Elective-I)

Time : 3 Hours}

{Max. Marks: 75

**Note:** Answer all questions of Part - A and answer any five questions from Part-B.**PART – A (25 Marks)**

1. What are various H.S.S. materials ? Give their composition and advantages.
2. What is principle of operation of ECM ?
3. Differentiate between internal broach and external broach.
4. Distinguish between honing and lapping operations.
5. What is the principle of adjustable reamers ?
6. Sketch and explain a simple latch clamp .
7. Why tool proofing is done in fixtures ?
8. What is the significance of 'strip layout' in sheet metal work ?
9. Distinguish between piercing and blanking operation.
10. Mention two advantages of CBN tool materials.

**PART – B (50 Marks)**

- 11.(a) Classify carbide tools.  
(b) Sketch and explain Burnishing, lapping and honing operations and application of these operations.
- 12.(a) Draw a neat sketch of a pull broach for making a spline hole showing all the elements of angles and high-lighting the action of cutting teeth while broaching.  
(b) How do you determine the form tool profile for a given rake angle and tool setting height ?
- 13.(a) Draw a neat sketch of a twist drill and indicate its standard.  
(b) Explain the methodology used in determine the manufacturing tolerances in reamers.
- 14.(a) With neat sketches, explain the terms 'centre of pressure', 'spring back', 'drawing ratio' and 'clearance' in die designs.  
(b) A hollow cup of dia 40mm and depth 35mm has to be drawn from 2mm thick steel sheet. Determine the blank diameter and capacity of press required for the above. Take UTS as 4500 kgs/cm<sup>2</sup>.
- 15.(a) Compare physical parameters of USM, EDM, EBM and LBM with respect to voltages current, power consumption, gap and medium.  
(b) Explain the general considerations in the design of a peripheral milling cutters.
- 16.(a) Give various designs of rest plates. Sketch and explain a simple latch clamp.  
(b) Sketch and explain air hydraulic booster circuit for clamping mechanism.
17. Write short note on any three of the following :
  - (a) Quick acting clamping devices
  - (b) Economics of a fixture
  - (c) Design features of tap
  - (d) Merchant circle
  - (e) Orthogonal and Oblique cutting

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