

III B.Tech II Semester Supplementary Examinations, Apr/May 2008
TOOL DESIGN
(Production Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Why can relief (or) clearance angles never be zero or negative?
 (b) Why are relief angles on carbide tools kept as small as possible?
 (c) What are the advantages of providing side cutting edge angle on cutting tools?
 (d) Why a built up edge on a tool is undesirable? [4+4+4+4]
2. (a) What is the point angle of drill? Give its value for different materials.
 (b) Write short notes on the materials for drills.
 (c) Discuss the design feature of twist drills. [5+5+6]
3. Explain the following with neat sketches
 (a) Shell reamer
 (b) Chucking reamer. [8+8]
4. (a) What is scrap strip layout? Explain
 (b) A part shown in Figure 4b is to be made from a M.S sheet 3mm thick & 2m long. Determine
 - i. Strip layout
 - ii. number of part that can be punched from the strip
 - iii. % Of stock used
 - iv. Weight of material needed to produce an blank [6+10]

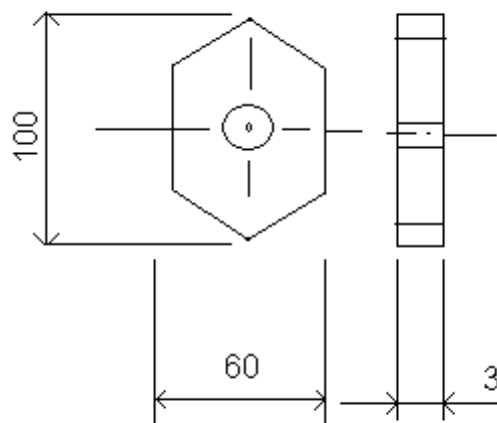


Figure 4b

5. (a) What is drawing? What type of components can be made by drawing operation?
(b) Sketch and describe a simple drawing die. [8+8]
6. With the help of neat sketch explain the following: [4×4=16]
(a) Two way clamp
(b) Hinged clamp
(c) Bridge clamp
(d) Heel clamp.
7. Describe the various drill bushings. [16]
8. (a) Explain the cam design for single spindle automatics for simple components.
(b) Explain the tool layout estimation of cycle. [8+8]

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(b) Why are relief angles on carbide tools kept as small as possible?
(c) What are the advantages of providing side cutting edge angle on cutting tools?
(d) Why a built up edge on a tool is undesirable? [4+4+4+4]
2. (a) What do you understand by tool signature.
(b) With neat sketch explain about NRS. [8+8]
3. Explain the following with neat sketches:
(a) Profile sharpened milling cutter
(b) Form relieved milling cutter. [8+8]
4. (a) Describe the method of calculating Cutting force in blanking and punching.
(b) Discuss the variation of cutting force with various stages during shearing of metal.
(c) Discuss the factors which affect the shearing force. [6+5+5]
5. Explain clearly about
(a) Shear forming and
(b) Flow forming. [8+8]
6. (a) Write short notes on the following:
i. clamping force
ii. choosing a locating surface.
(b) What is redundant location? Explain it with neat sketch. How to eliminate Redundant location? [8+8]
7. Describe the various drill bushings. [16]
8. (a) Explain the cam design for single spindle automatics for simple components.
(b) Explain the tool layout estimation of cycle. [8+8]

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1. Write short notes on following tool materials:

- (a) Cast cobalt base alloys
- (b) Diamond tools
- (c) Cubic boron nitride
- (d) Coated cemented carbides.

[4+4+4+4]

2. Explain the following with neat sketch.

- (a) ORS
- (b) MRS

[8+8]

3. Explain the following with neat sketches:

- (a) Profile sharpened milling cutter
- (b) Form relieved milling cutter.

[8+8]

4. (a) What is center of pressure? Describe the method of determining the center of pressure

- (b) Determine the center of pressure for the following components shown in Figure 4b.

[6+10]

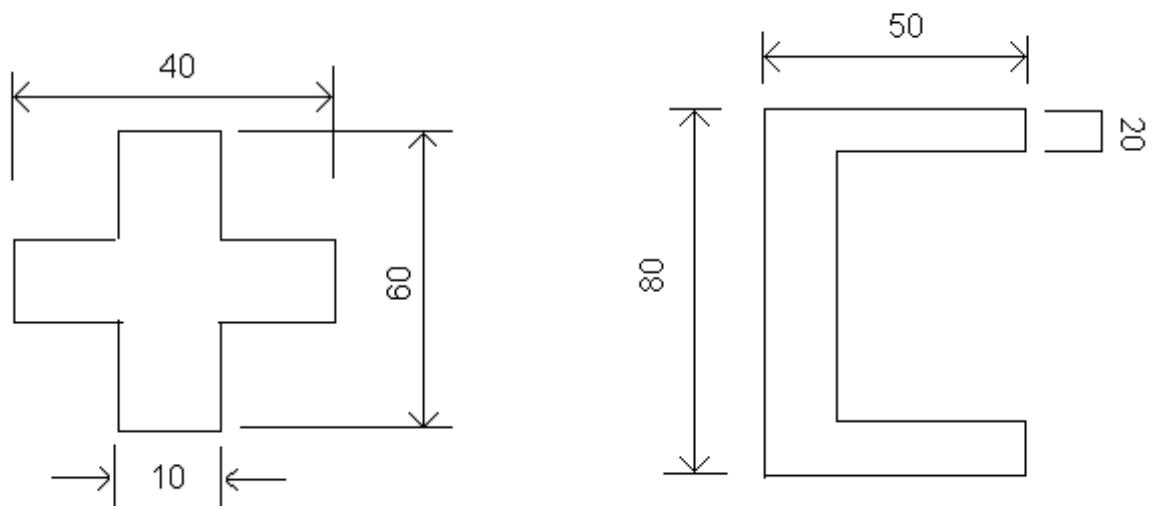


Figure 4b

5. (a) What is drawing? What type of components can be made by drawing operation?
(b) Sketch and describe a simple drawing die. [8+8]
6. (a) What is fool proofing as applied to jig and fixtures? How it can be achieved?
(b) What are the important points to watch in respect of location?
(c) What are the materials used for locating and clamping elements? [5+5+6]
7. (a) With neat sketches describe Renewable bushings.
(b) Describe the design principles for drilling jigs. [8+8]
8. (a) Explain the cam design for single spindle automatics for simple components.
(b) Explain the tool layout estimation of cycle. [8+8]

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1. (a) Clearly explain the properties of cutting tool materials.
(b) What are the major constituents in HSS? Explain the properties and applications of it. [6+10]
2. (a) What do you understand by tool signature.
(b) With neat sketch explain about NRS. [8+8]
3. Explain the following with neat sketches:
(a) Profile sharpened milling cutter
(b) Form relieved milling cutter. [8+8]
4. (a) Name and explain the various sheet metal cutting operations.
(b) What are the various ways in which presses can be classified?
(c) What factors should be considered in selecting an appropriate press for a given job. [6+6+4]
5. Write short notes on the following:
(a) Blank holder pressure
(b) Radius on drawing punch and die
(c) Lubricants used in drawing
(d) Drawing speed. [4×4=16]
6. Write short notes on the following:
(a) Cams used in clamps
(b) Wedge clamp. [8+8]
7. (a) With neat sketches describe Renewable bushings.
(b) Describe the design principles for drilling jigs. [8+8]
8. (a) Define the following for a forging die with the help of a sketch.
 - i. Flash
 - ii. Cutter
 - iii. Draft
 - iv. Parting line

Code No: RR322001

Set No. 4

(b) Discuss the various factors of a good forging design.

[12+4]
