

III B.Tech. II Semester Regular Examinations, April/May -2005

TOOL DESIGN

(Production Engineering)

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

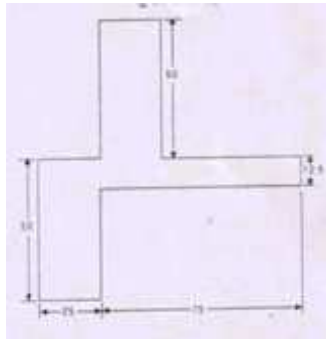
1. (a) State the factors which affect design of tools.
(b) Discuss the duties of tool designer.
(c) List out the safety factors to be considered during design of a tool.
(d) Discuss various types of chips produced during metal cutting.
2. (a) Write the classification of form tools.
(b) Discuss the design features of form tools.
3. Explain the following with neat sketches:
(a) Profile sharpened milling cutter
(b) Form relieved milling cutter.
4. (a) What is bending? Explain.
(b) Define the following:
 - i. Bend allowance
 - ii. Angle of bend
 - iii. Set back.
5. (a) What is drawing? What type of components can be made by drawing operation?
(b) Sketch and describe a simple drawing die.
6. With the help of neat sketch explain the following:
 - (a) Two way clamp
 - (b) Hinged clamp
 - (c) Bridge clamp
 - (d) Heel clamp.
7. (a) With neat sketches describe Renewable bushings.
(b) Describe the design principles for drilling jigs.
8. (a) What is forging? What is press forging and upset forging?
(b) Compare smith forging and drop forging.
(c) Compare open and closed die forging.

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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.
2. What do you understand by form tools? For what applications these are used? How many types of form tools are in common use? Describe them.
3. (a) Write short notes on number of teeth on milling cutter.
(b) Explain with neat sketches the geometry of face milling cutter.
4. (a) Explain the operation of a simple die
(b) Calculate the center of pressure of the following blanked shapes



- (c) Find the total pressure dimensions of tools to produce a washer of 5cm out side diameter with 2.4 cm diameter hole, from material of 4mm thick, having a shear strength of 360 N/mm².
5. Write short notes on the following:
 - (a) Number of draws
 - (b) Metal Spinning
 - (c) Difference between shallow drawing and deep drawing
 - (d) Difference between single action dies and double action dies.
6. (a) Define a jig and a fixture. What are the functions of jigs and Fixtures?
(b) Name the essential elements which make up a jig or a fixture.
7. (a) Why should a jig have four feet and not three? Explain the reason.

- (b) Sketch the various types of jig feet.
- 8. (a) What is a Template gauge? Sketch and describe them .
- (b) Explain various steps for the design of forging dies.

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1. (a) Write short notes on cemented carbides.
(b) Why coated cemented carbides were developed? What are the different types of Coated cemented carbides are there? Explain their properties clearly.
2. (a) What do you understand by tool signature.
(b) With neat sketch explain about NRS.
3. Explain the following with neat sketches:
(a) Profile sharpened milling cutter
(b) Form relieved milling cutter.
4. Write short notes on the following:
(a) Cutting action in die
(b) Die set materials
(c) Methods of punch support
(d) Methods of die support.
5. Write short notes on the following:
(a) Clearance between Punch and Die for drawing operation
(b) Formula for calculating reduction in wall thickness of a drawn shell
(c) Drawing ratio
(d) Ironing of a cup.
6. With the help of neat sketch explain the following:
(a) Two way clamp
(b) Hinged clamp
(c) Bridge clamp
(d) Heel clamp.
7. (a) What is a drilling jig? What are the requirements of a drilling jig?
(b) With neat sketches describe indexing jigs.
8. (a) What is a guage?

- (b) State the purposes of gauges.
- (c) How does a guage differ from a measuring instrument?
- (d) How the plain guages are classified?

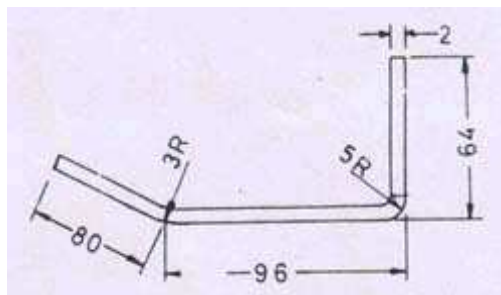
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1. (a) Clearly explain the properties of cutting tool materials.
(b) What are the major constituents in HSS? Explain the properties and applications of it.
2. (a) With neat sketches explain the following :
 - i. Double cone drills
 - ii. Chip breaker drills(b) How drill point grinders can be classified?
3. Explain with neat sketch about the following :
 - (a) Key way broaching
 - (b) Spline broaching.
4. (a) What is spinning? What are the methods to prevent spring back? Explain with a neat sketch
(b) Calculate the developed length of the part shown in the figure.



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.
6. (a) Explain with the aid of suitable sketches the principles of jig and fixture design.
(b) What are important points to watch in respect of clamping? How should clamps be disposed of with respect to location points?

7. (a) What is the drill bushing? What are the applications of bushings?
(b) With neat sketch describe the following:
 - i. Press fit bushings.
 - ii. Linear bushing.
8. Write short notes on the following .
 - (a) Maximum metal condition
 - (b) Minimum metal condition
 - (c) Dial gauge
 - (d) Thread gauge.
