

Code No: D3306, D5206

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY-2012**

TOOL DESIGN

(COMMON TO ADVANCED MANUFACTURING SYSTEMS, DESIGN FOR MANUFACTURING)

Time: 3hours

Max. Marks: 60

**Answer any five questions
All questions carry equal marks**

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- 1.a) Discuss in brief the essential requirements of a tool material. List the various cutting tool materials used in industry.
- b) Discuss the role of chromium, molybdenum, cobalt, vanadium and tungsten in tool steels.
- 2.a) Explain the effect of rake angle and clearance angle on cutting tools. Discuss the effect of negative rake angle on tools in brief.
- b) Describe the nomenclature of twist drill with the help of a neat sketch.
- 3.a) What is meant by locating? Explain the principle of 3-2-1 location with a neat sketch.
- b) With the help of neat sketches explain the various clamping devices in use.
- 4.a) Define a jig. Differentiate between a jig and a fixture. Name the essential elements which make up a jig.
- b) List the various types of jigs. Describe any two of them with suitable sketches.
- 5.a) Describe the various types of presses in brief. State the merits and demerits of hydraulic press over mechanical press.
- b) Explain the construction and working of progressive die with a neat sketch.
- 6.a) Differentiate between bending and forming. Describe the various methods of bending with the help of simple sketches.
- b) A 300mm long, 25mm wide and 2.5mm thick metal strip is to be bent in a v-shaped die. Calculate the bending force required if the material has 500MPa tensile strength.
- 7.a) Discuss the important variables that affect metal flow during drawing operation in brief.
- b) What is a double-action draw die? Describe a double action draw die with a neat sketch.
8. Write short notes on any **THREE** of the following:
 - a) Coated carbide tools.
 - b) Grinding fixtures.
 - c) Materials handling equipment
 - d) Die clearance and its importance
 - e) Determination of blank size.