

GUJARAT TECHNOLOGICAL UNIVERSITY**BE SEM-V Examination-Nov/Dec.-2011****Subject code: 152502****Date: 24/11/2011****Subject Name: Tool Design****Time: 2.30 pm -5.00 pm****Total marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) What is the Six-point location principle? Explain it with the help of suitable sketches. **07**

(b) Sketch a single point cutting tool and show on it the various tool elements and tool angles. **07**

Q.2 (a) Discuss the various types of chips produced during metal cutting. **07**

(b) In an orthogonal cutting operation, the following data have been observed: **07**

Cutting speed = 0.223 m/s Uncut chip thickness = 0.06 mm
Width of cut = 3.83 mm Chip thickness ratio = 0.51
Cutting Force = 363 N Thrust Force = 127 N
Rake angle = 20°

Determine: Shear angle, friction angle, shear stress along the shear plane, chip velocity, shear strain in chip and the power for the cutting operation.

OR

(b) What do you understand by tool life? Explain various variables that play an important role in tool life. **07**

Q.3 (a) What is meant by 'Clearance'? What are the effects of inadequate clearance and excessive clearance upon die-cut metals? **07**

(b) Differentiate between **07**

- i) Cutting die and Forming die.
- ii) Blanking die and Piercing die.
- iii) Combination die and compound die.

OR

Q.3 (a) What are the various ways in which presses can be classified? **07**

(b) Define the terms used with press working **07**

- | | | | |
|------------------|---------------|------------------|-----------------|
| i) Bolster Plate | ii) Die block | iii) Punch Plate | iv) Shut height |
| v) Die | vi) Pitman | vii) Stripper. | |

Q.4 (a) Explain and compare "Hole basis system" and "Shaft basis system" of fits. **07**

(b) Discuss the following design feature of a milling cutter: **07**

- i) Size of cutter ii) Tool angles iii) flutes iv) Number of teeth
- v) Power required for milling.

OR

- Q.4 (a)** Draw a neat sketch of twist drill and state its following elements. **07**
i) Helix angle ii) Lip relief angle
iii) Margin iv) Chisel edge.
- Q.4 (b)** How the plain gauges are classified? **07**
- Q.5 (a)** Shaft of $75^{+0.02}_{-0.02}$ mm diameter are to be checked by the help of a Go, Not Go **07**
Snap gauges. Design the gauge and show its Go size and Not Go size dimensions. Assume normal wear allowance and gauge maker's tolerance.
- (b)** Describe the properties of coolants. Explain different types of coolants with **07**
their applications.

OR

- Q.5 (a)** Design and draw drilling jig for drilling the holes in the component shown in figure-1. **14**

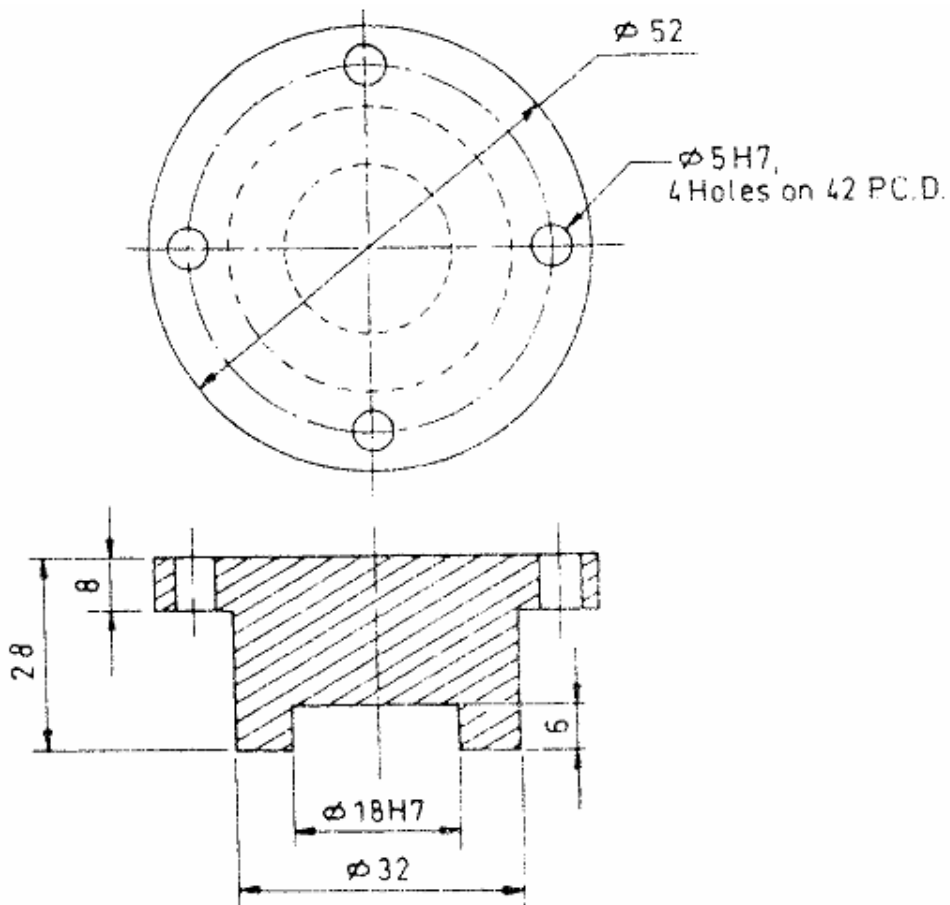


Figure-1
