

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Sem. - V - Examination – June- 2011****Subject code: 152502****Subject Name: Tool Design****Date: 22/06/2011****Time: 10:30 am – 01:00 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 are the various location devices? Explain these with the aid of suitable sketches. **07**
- (b) What are the various types of strippers? Explain their functions with the help of suitable sketches. **07**

- Q.2** (a) Explain the various elements of a single point cutting tool with the help of a neat diagram. **07**
- (b) Why tool wear is important in metal cutting? Discuss various types of tool wear. **07**

OR

- (b) Discuss the following design features of a milling cutter. **07**
- (i) Power required for milling.
 - (ii) Number of teeth.
 - (iii) Size of cutter.

- Q.3** (a) What is meant by the term “fit”. Explain the various types of fits. **07**
- (b) Design ‘GO’ and ‘NO GO’ ends of a plug gauge to measure a hole size $75 \pm 0.05 \text{ mm}$, adopting (i) Unilateral system and (ii) Bi-lateral system. Assume normal wear allowances and gauge maker’s tolerance. **07**

OR

- Q.3** (a) Discuss the design factors to be kept in mind when designing the cutting elements of a tool. **07**
- (b) Define ‘Tool’ and ‘Tool Design’ and discuss its importance in process planning. **04**
- (c) Differentiate between: Work shop gauge, Inspection gauge and Master gauge. **03**

- Q.4** Design and draw a drilling jig to drill the holes in the component shown in figure (i). **14**

OR

- Q.4** Design and draw punch and die assembly for the component as shown in figure (ii) **14**
- Take shear stress for the material as 400 N/mm^2

- Q.5** (a) Discuss various types of cutting fluids along with its specific applications. **07**
- (b) Explain “Merchant force circle” with neat sketch. **04**

- (c) The following data relate to an orthogonal cutting process: 03
 Chip thickness = 0.65mm, Feed = 0.25mm/rev., Rake angle = 15° .
 Calculate: (i) cutting ratio and chip reduction co-efficient, (ii) shear angle and (iii) the dynamic shear strain involved in the deformation process.

OR

- Q.5** (a) Discuss design features of form tools. 07
 (b) List advanced cutting tool materials and discuss any two with their advantages, limitations and specific applications. 07

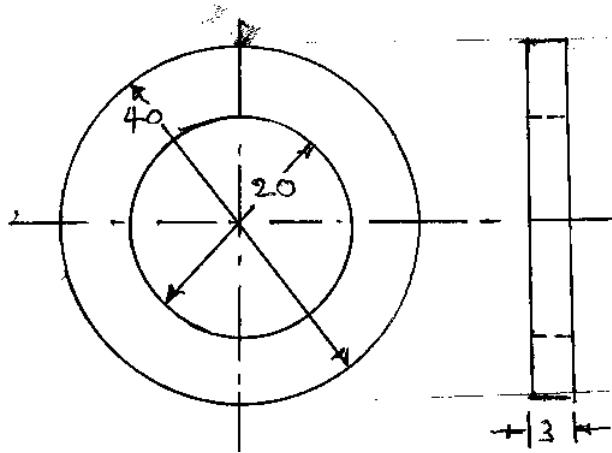


Figure (i), Q.4

(All dimensions are in mm)

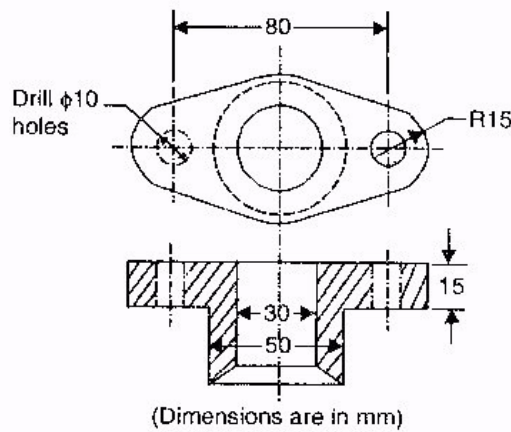


Figure (ii), Q.4 (OR)