

BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI DUBAI CAMPUS
WORKSHOP PRACTICE (TA UC112)
I SEMESTER 2004 -2005 TEST -1 (Regular)

Max. Marks: 30
Closed book

Duration: 50 Min.
Date: 24/10/04

- Answer all the questions.
 - Answer the questions sequentially.
1. It is required to produce hole having size $21.36^{+0.01}$ at the center of the workpiece as shown in figure 1 (All dimensions in mm).

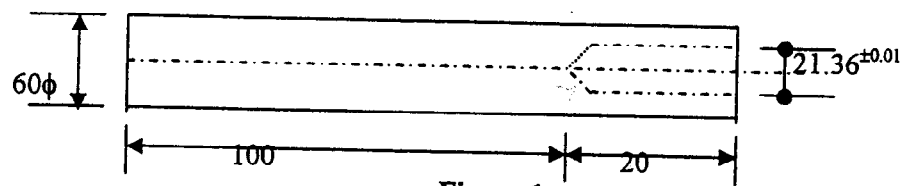


Figure 1

All the operations are required to be carried out on lathe. Commercially available drill sizes are 15, 17, 20, 22 and 25 mm. Assume other tools are available to the required sizes. (i) Write down a possible sequence of producing the part (ii) Assuming $v = 30$ m/min and $f = 0.1$ mm/rev for all operations calculate the machining time. Assume approach = 10 mm, overtravel = 5 mm and all operations are done in one pass. **20 M**

2. (a) It is required to manufacture component shown in figure 2 from a rectangular workpiece. Which type of machine tool(s) and cutting tool(s) you recommend to machine the profile. **05 M**

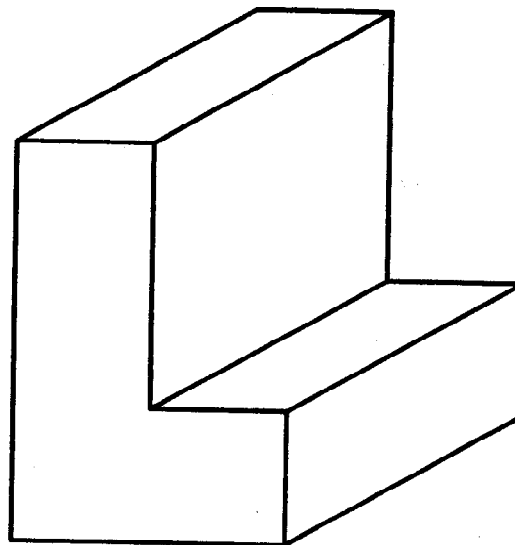


Figure 2

- (b) Does the tolerance chosen affect the production cost and time of product being manufactured? If yes, how? **5M**

**BITS, PILANI DUBAI CAMPUS
WORKSHOP PRACTICE (TA UC112)**

I SEMESTER 2004-2005 SECOND TEST (Regular)

**Max. Marks : 30
Open book**

**Duration : 50 Min.
Date: 19/12/04**

1. A fruit juice can is to be manufactured using extrusion process. Two materials that can be used are stainless steel and aluminum. The process has to be carried out at a temperature of about 65% of the melting point of the material used. Ms. X says that she will be using the aluminum to make the can, while Mr. Y says that he will use stainless steel. Who is correct and why? Justify. **8 M**
2. Component shown in Figure 1 is to be manufactured. Is it possible to manufacture the component by using casting process as a single piece? If yes, explain how it can be made (which type of pattern etc.). If no, explain why it cannot be made. **5M**

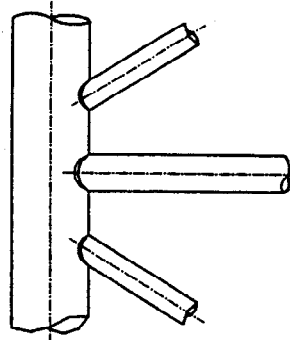


Figure1

3. Table 1 shows approximate costs of different machine tools (\$). Other than the size of the machine, what factors are involved in the range of prices in each machine category? **5M**

Table 1 : Table for question 3

Machine	Drilling	Milling	Lathe	Boring
Cost (\$)	10 - 100	10 - 250	10 - 100	30 - 150

4. A part shown in the Figure 2 (all dimensions are in mm) has to be manufactured from a block of size $300 \times 250 \times 170$ mm using end mill of 50mm diameter with 12 teeth. If depth of cut is 5 mm, feed per tooth is 0.1 mm, cutting speed is 30 m/min, calculate the total machining time. Assume approach and overtravel distance as 80 mm. **12M**

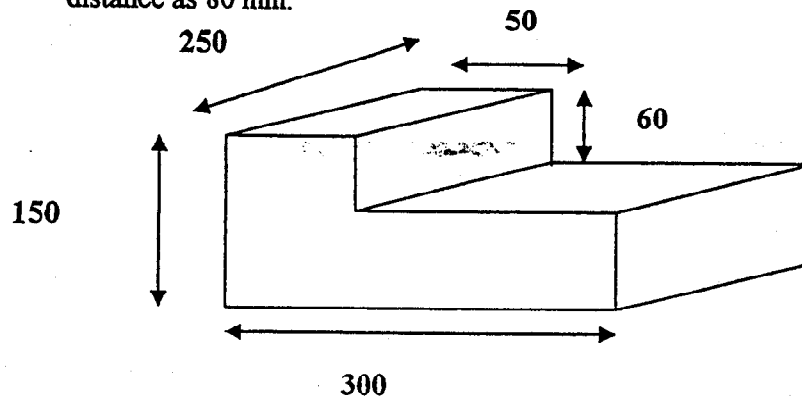


FIG-2

1st year

BITS, PILANI DUBAI CAMPUS
WORKSHOP PRACTICE (TA UC112)
I SEMESTER 2004-2005

COMPREHENSIVE EXAMINATION (Regular)

Max. Marks 75
Closed book

Duration : 180 Min.
Date 6/1/05

- Answer all sub questions of a particular question sequentially.
 - Assume any missing data suitably.
 - Give proper justifications wherever required and underline the keywords.
1. (a) Classify the following processes into *mass conserving*, *mass-reducing* and *others*: Casting, boring, milling, lancing, grinding, buffing, rolling, arc welding, riveting. **4M**
- (b) In Figure 1, identify the (i) back rake angle and (ii) side relief angle specifying tool geometry of a single point cutting tool. (Draw neat sketch of only necessary view(s) of the single point cutting tool shown in the figure and show asked angles). **2M**

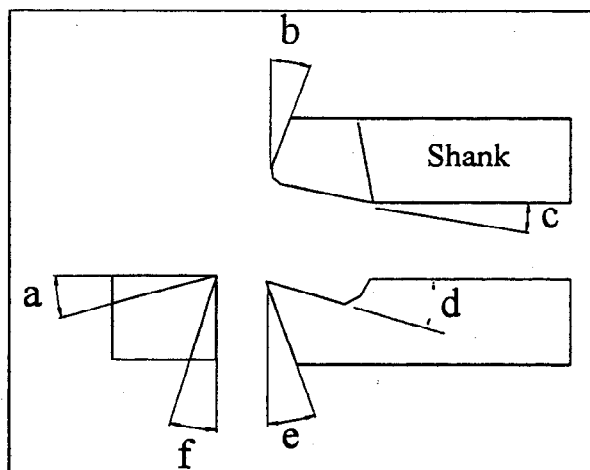


Figure 1

- © Find the type of fit obtained if the size of hole is $25.00^{-0.007}$ mm and size of shaft is $25.00^{+0.009}_{+0.001}$ mm. **3M**
2. (a) When you sharpen your scissor/knife you observe sparks. Where as when carryout machining operations such as facing, turning etc. you do not. What is the reason? **4M**

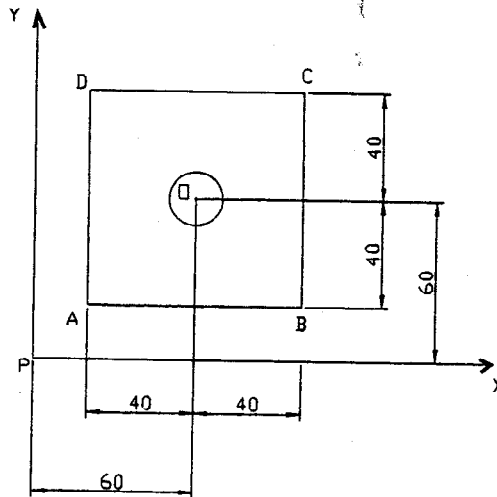


Figure 2

5. (a) Can we use non-traditional machining processes in the following cases? Justify your answer. 2M×3
- (i) Water jet machining process for machining cast iron.
 - (ii) Laser beam welding for joining two aluminum pieces.
 - (iii) Electron beam machining process for producing very small holes.
- (b) *Answer in one line* (Answer all the questions continuously) (10M×1)
- (i) Which operation is used for providing seating arrangement for the head of screw?
 - (ii) Which type of welding (forehand or backhand) is used for joining two thin workpieces?
 - (iii) Which type of layout is used in the manufacture of Airplanes.
 - (iv) Scheduling is difficult in which type of layout?
 - (v) What do you call for welding process done without filler material?
 - (vi) What do you call for the portion of the base material that is melted due to heat in welding?
 - (vii) Give one practical application of the product where hemming is done.
 - (viii) During oxyacetylene welding, which type of flame produces deposition of carbon on workpiece surface?
 - (ix) Write the modified Taylor's tool life expression considering all operating conditions.
 - (x) Why the tool life graphs are plotted on log-log graph?

