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BME-011

00282

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

December, 2011

BME-011 : COMPUTER AIDED PROCESS PLANNING

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt **any seven** questions.*

(ii) Assume suitable value for any missing data.

*(iii) Use of **scientific calculator** is permitted.*

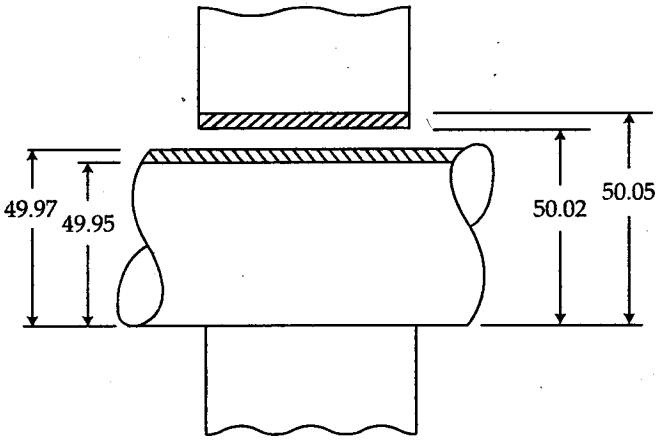
1. (a) What are the objectives of Computer Aided Process Planning ? **2x5=10**

   (b) Describe the advantages and disadvantages of process planning.

2. (a) Explain the various properties of cutting tool materials. **2x5=10**

   (b) Briefly explain the factors affecting the tool life.

3. (a) Find the values of allowance, hole tolerance and shaft tolerance for the following dimensions of the mated parts according to basic hole system (Figure - 1) **2x5=10**



Basic size = 50 mm

All dim are in mm.

Figure - 1

(b) The Taylor tool life equation for machining C-40 steel with a 18 : 4 : 1 H.S.S cutting tool at a feed of 0.2 mm/min and a depth of cut of 2mm is given by $VT^n = c$, Where n and c are constants. The following V and T observations have been noted

V, m/min	25	35
T, min	90	20

Calculate (i) n and c

(ii) Cutting speed for tool life of 60 minutes.

4. (a) A 10mm diameter hole is to be drilled in a block of magnesium alloy. The feed is 0.2 mm/rev and the spindle speed is 800 rev/min. Calculate material removal rate, cutting power and torque on drill. (Given avg cutting power for Mg alloy is 0.5 W.s/mm^3) **2x5=10**

(b) Draw a neat sketch of twisted drill bit mentioning all the nomenclature.

5. (a) Distinguish between drop forging and press forging processes with reference to the process and products obtained. **2x5=10**

(b) Explain the casting process which will be preferred by you to cast an iron dumb bell.

6. (a) Explain the use of Break-Even-Analysis in machine selection. **2x5=10**

(b) Explain the term tool specification for single point cutting tool.

7. (a) Give brief description of the retrieval type of Computer-Aided Process-Planning. **2x5=10**

(b) Explain how are the part prints prepared ?

8. (a) Define ***any two*** of the following terms. **2x5=10**

(i) Interference

(ii) Allowance

(iii) Clearance.

(b) A through hole of 40 mm diameter and 50 mm depth is to be drilled in a mild steel component. The cutting speed can be taken as 65 m/min and the feed rate as 0.25 mm/rev. Calculate the machining time and material removal rate.

9. (a) Drive an equation for the estimation of machining time in milling process. **2x5=10**

(b) Explain the relationship between the machining cost and cutting speed in turning operation using a neat graph.
