BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

01611

Term-End Examination
December, 2010

BME-011 : COMPUTER AIDED PROCESS PLANNING

Time : 3 hours   *Maximum Marks : 70*

Note :   1. *Attempt **any five** questions.*
2. *Any data not supplied can be assumed suitably.*
3. *Use of **calculator** is permitted*

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1. (a) Explain significance of computer aided process planning in computer integrated manufacturing.   6

   (b) With the help of suitable block diagram explain the typical sequence of processes required in part fabrication.   6

   (c) List at least four benefits of CAPP.   2

2. (a) Write the purpose of route sheet. What are the information that a typical route sheet contains ?   5

   (b) Write the various steps involved in automated process planning.   4

(c) What are the difference between retrieval **5** and generative type of computer aided process planning ? Which is better ? Explain your choice.

3. (a) How can changes in product design affect **3+4** processing ? What can the process engineer do to minimize these affects ?

(b) Briefly describe the factors influencing the **7** selection of tools.

4. (a) Calculate the drilling speed if a 40 mm dia **7** hole of 50 mm depth is to be drilled in a MS component. The feed rate is 0.2 mm/rev and MRR is 200 cen^3/min. Also calculate the machining time.

(b) In a metal cutting experimentation the tool **7** life was found to vary with cutting speed in the following manner :

Cutting speed, Vm/min   Tool life T (min)

100	120
130	60

Derive the Taylor's tool life equation for this operation and estimate the tool life at a speed of 2.4 m/s. Also estimate the cutting speed for a tool life of 75 minutes.

5. (a) Distinguish between a qualifying operation **5** and a critical operation.

(b) List and discuss the main factor to be **5** considered when selecting a material to satisfy a particular design requirement.

(c) Specify the appropriate material and manufacturing process for camshaft of family car and give the reasons in support of your answer. 4

6. (a) Compare the relative merits and demerits of unilateral and bilateral tolerances with suitable applications. 5

(b) Discuss geometrical tolerances with suitable examples. 6

(c) List the elements of machining cost. 3

7. (a) Derive an equation for the estimation of machining time in shaping process. 7

(b) Describe the role of process planning in CAD/CAM integration. 7

8. (a) Under what kind of environment should generative process planning be used instead of variant process planning. 7

(b) With the help of a flow - chart, explain the functions carried out by various modules in a sheet metal CAPP system. 7