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BME-011

B.Tech. MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

00120

Term-End Examination

June, 2014

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 factors considered while preparing the process plan ? *5*

(b) With the help of suitable block diagram, show a typical sequence of processes required in part fabrication. *5*

2. (a) Write the various steps involved in process planning. *5*

(b) What is a break-even chart ? What purpose is it mostly used for ? *5*

3. (a) Differentiate between manual process planning and computer aided process planning. *5*

(b) What are the problems associated with the variant approach of process planning ? *5*

4. (a) State some of the vital requirements when ceramics cutting tools are used in metal removal processes. *5*

(b) With suitable notations, write and explain the Taylor's tool life equation. *5*

5. (a) With the help of suitable sketches, enlist the various operations performed on lathe. *5*

(b) Calculate the spindle speed (N) if a C-40 steel job of 80 mm dia. is to be turned by

(i) HSS tool

(ii) Carbide tool

Given cutting speed V_C for C-40 steel for

HSS = 30 m/min

Carbide = 145 m/min *5*

6. (a) Explain the principle underlying the resistance welding processes. Give names of products wherein the following processes are used : *6*

(i) Spot welding

(ii) Seam welding

(iii) Flash welding

(b) How do composite materials differ from alloys ? *4*

7. (a) Find out the values of allowance, hole tolerance, and shaft tolerance for the following dimensions of mated parts, according to basic hole system. *5*

Hole : 37·50 mm Shaft 37·47 mm

37·52 mm Shaft 37·46 mm

(b) A through hole of 50 mm dia. and 60 mm depth is to be drilled in a mild steel component. The cutting speed can be taken as 60 m/min and the feed rate as 0·2 mm/rev. Calculate the machining time and metal removal rate. *5*

8. (a) With the help of neat graph, explain the relation between the machining cost and the cutting speed. *5*

(b) Define process capability with its practical relevance. *5*

9. (a) What are the inputs and outputs of a CAPP system for machined parts ? Show with the help of input and output diagram. *5*

(b) Write the sequence to implement variant process planning system. Write the importance of family formation. *5*

10. (a) Describe the knowledge based (expert) process planning strategy to follow CAPP system. *5*

(b) Enlist the broad objectives in developing a CAPP system for sheet metal forming. *5*
