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BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2011

BME-011 : COMPUTER AIDED PROCESS PLANNING

Time : 3 hours *Maximum Marks : 70*

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

(ii) Any data not supplied can be assumed suitably.

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

1. (a) Define production planning system and list the benefits of CAPP. **7**

(b) What is a break - even chart ? What purpose it is mostly used for ? **7**

2. (a) Differentiate between manual process planning and computer aided process planning. **4**

(b) A carbide cutting tool has tool life exponent $n = 0.27$. It gives a tool life of 60 minutes while machining a mild steel work piece at a cutting speed of 120 m/min. Compute the tool life if it is to be cut at a 20% higher cutting speed. **5**

(c) Briefly explain the methodology to be followed for developing retrieval type of computer aided process planning system. 5

3. (a) How the single point cutting tool are normally specified ? List and briefly explain atleast eight lathe operations. 2+8

(b) Calculate the cutting speed when a workpiece of 90 mm diameter is being turned. The spindle speed being 300 rpm. 4

4. (a) With the help of suitable chart give the general classification of shape-casting processes. 7

(b) List the advantages of forging of metals. Why is press forging preferred over hammer forging process ? 7

5. (a) Explain the principle underlying the resistance welding process. Give names of products wherein the following processes are used. 4+3

(i) Spot welding

(ii) Seam welding

(iii) Flash welding

(b) The specifications for a critical characteristics of an electric resistor call for it to have a resistance of 900 $\pm$ 30 ohms. The process for making the resistors produces a normal distribution of measurements of resistance with a standard deviation of 5.50 ohms. 7

(i) Calculate Cp for this situation.

(ii) Is the process capable of performing the operation successfully ?

6. (a) Define the following with examples. 6

(i) Allowance

(ii) Clearance

(iii) Interference

(b) With a neat graph explain the relation between the machining cost and the speed 5

(c) With suitable notation write the formulae of machining time in cylindrical grinding. 3

7. (a) Identify several factors that can cause a process to became out of control. 6

(b) Briefly give an outline of the variant Process planning approach. 8

8. (a) With suitable example describe production Flow Analysis. 7

(b) List down the activities carried out by the planning engineers in a foundry environment which form the basis of developing a CAPP System. 7