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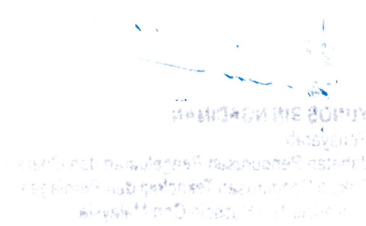
**FINAL EXAMINATION
SEMESTER I
SESSION 2013/2014**

COURSE NAME : MANUFACTURING TECHNOLOGY
COURSE CODE : BPB 23303
PROGRAMME : 2 BPB
EXAMINATION DATE : DECEMBER 2013/JANUARY 2014
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF **THREE (3)** PAGES

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- Q1** (a) Describe **TWO (2)** types of Assembly Operations. (4 marks)
- (b) Describe **THREE (3)** categories of Processing Operations. (6 marks)
- (c) Explain model of Production Systems with appropriate illustration. (10 marks)
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- Q2** (a) Explain the metal linear elastic stress-strain curve that yield strength is defined as a 0.2% offset strength. (10 marks)
- (b) Describe the continuously loading and unloading of a tensile-test specimen by using an illustration. (10 marks)
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- Q3** (a) Differentiate the characteristics of Pure Metal and Alloys during the solidification. (10 marks)
- (b) Differentiate **FIVE (5)** functions of use and without using of cutting fluids in machining operations. (10 marks)



Q4 Three metal pieces being cast have the same volume but different shapes. One is a sphere, one is a cube and the other is a cylinder with height equal to its diameter.

(a) Solve the Solidification Time for:

(i) Sphere

(5 marks)

(ii) Cube

(5 marks)

(iii) Cylinder

(5 marks)

(b) Based on answer **Q4(a)**, determine which piece will solidify the fastest by assuming that $n = 3$.

(5 marks)

Q5 The Material-removal rate (MRR) in turning is the volume of material removed per-unit time, with the units of mm^3/min . A 304 stainless-steel solid rod of 160 mm-long, 12.5 mm-diameter is reduced to 12.0 mm-diameter by turning on a lathe machine. The spindle rotates at $N = 450$ rpm and the tool is traveling at an axial speed of 220 mm/min.

Calculate:

(a) Cutting speed

(5 marks)

(b) Material-removal rate

(5 marks)

(c) Power dissipated

(5 marks)

(d) Cutting force

(5 marks)

-END OF QUESTION-