UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2011/2012

COURSE NAME	:	MANUFACTURING TECHNOLOGY
COURSE CODE	:	BDA 3052 / BDA 30502
PROGRAMME	:	BACHELOR OF MECHANICAL ENGINEERING WITH HONOURS
DATE OF EXAMINATION	:	JUNE 2012
DURATION	:	2 HOURS ONLY
INSTRUCTION	:	ANSWER ANY **THREE** (3) FROM PART A AND ANY TWO (2) FROM PART B

THIS PAPER CONTAINS FOUR (4) PAGES

PART A (75 MARKS):

This section contains **FOUR (4)** questions. Choose and answer any **THREE (3)** questions only

Q1 (a) Analyze the reasons for rough surface roughness in machining.

(8 marks)

(b) How manufacturing industries can be classified and what are all the industries in that category? Give examples for each industry.

(8 marks)

(c) Sketch a single point cutting tool and name their parts.

(9 marks)

Q2 (a) A product to be manufacturing by casting process and only five pieces are required. Select a casting process and give reason for selecting it.

(8 marks)

(b) Liquid cast metal is kept all the time hot. Explain the process with simple sketch.

(8 marks)

(c) Crank shafts are required to be used in an automobile industry. What process can be selected to produce in order to increase the strength of the component? Explain the process.

(9 marks)

Q3 (a) Identify the three basic types of sheet metalworking operations. How bending and drawing of components differs?

(7 marks)

(b) Explain the difference between resistance seam welding and resistance spot welding?

(10marks)

(c) How welded parts are inspected? Which method is more suitable?

(8 marks)

Q4 (a) What are the reasons by which the bulk deformation processes are important commercially and technologically?

(6 marks)

(b) By the aids of sketch, explain the three basic steps in the conventional powder metallurgy shaping process?

(6 marks)

Q4 (c) What is calendaring in plastic processing? Where calendaring process can be used?
(6 marks)

(d) Distinguish between direct and indirect metal extrusion. Give examples for each of them.
(7 marks)

PART B (25 MARKS):

This section contains **THREE (3)** questions. Answer Q5 and answer any ONE (1) from Q6 or Q7

Q5 a) In a drilling operation of medium carbon steel work material, a 15.0 mm diameter twist drill is being used to drill a through hole at a depth 30 mm and the point angle is 118°. The cutting speed is set to 30 m/min and the feed is at 0.3mm/rev. Determine the time required to completely produce the hole and material removal rate.

(6 marks)

b) In an orthogonal cutting operation, the cutting tool has a rake angle of 12°. The depth of cut was 1.25 mm and the chips produced was having thickness of 1.75 mm. The diameter of the work material was 42 mm and rotates at 1200 revolutions per minute. The feed rate of the tool was 0.15 mm/rev.
Calculate the followings:

(a) chip thickness ratio
(b) Shear plane angle
(c) Time taken to turn 125 mm length out of total length of 275 mm.
(d) Material Removal Rate (MRR) for 125 mm length of turning

(9 marks)

Q6 Two tests were conducted to determine the relationship between cutting speed and tool life. In the first test, a cutting speed of 300 m/min results a tool life of 25 minutes. In the second test, a cutting speed, a cutting speed of 200 m/min which results a tool life 65 minutes.
Using Taylor's equation, calculate the following:

(a) Constant n and C.

(5 marks)

(b) If the life of tool to be extended to 75 minutes, what will be cutting speed tool?

(5 marks)

Q7 A slab milling operation is performed to finish the surface of square work materials which is having size of 200 mm by 200 mm. A multi point cutter with 6 inserts was used. The diameter of the cutter was 90 mm and the chip load was 0.25 mm/tooth and depth of cut was 2.5 mm. The cutting velocity was 90 m/minutes.
Calculate the following:

(a) Time taken to machine two passes

(5 marks)

(b) Material removal rate (MRR)

(5 marks)