Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017

COURSE NAME	:	MANUFACTURING PROCESS
COURSE CODE	:	DAM 32202
PROGRAMME	:	DAM
EXAMINATION DATE	:	JUNE 2017
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER ANY **FOUR (4)** QUESTIONS IN SECTION A ANSWER ANY **TWO (2)** QUESTIONS IN SECTION B

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

SECTION A

Q1 (a) Explain **three (3)** types of production facilities that are recognized as the most appropriate for manufacturing.

(6 marks)

(b) Factors that determine the performance of a manufactured product, other than mechanical and physical properties, include dimension and tolerance. Explain it.

(4 marks)

(c) Give **five (5)** characteristics of Successful Product Development.

(5 marks)

Q2 (a) Make a sketch of 3D orthogonal cutting operation and show the essential features such as t_0, t_c, width, tool, and chip.

(8 marks)

(b) Give **three (3)** basic type of chip in machining.

(3 marks)

(c) Compare the main difference between Peripheral Milling and Face Milling with aid of figures.

(4 marks)

Q3 (a) Mentioned the patterns used in a casting process.

(3 marks)

(b) Explain any of die casting process of your choice with the help of figure.

(5 marks)

(c) Mentioned all the defects that are likely to occur in casting process. Explain **four (4)** of them.

(4 marks)

(d) State the requirements which must be fulfilled by sand used for molding.

(3 marks)

Q4 (a) Make a sketch of injection molding extruder machine and show the essential features on it.

(6 marks)

(b) Explain a plastic injection molding operation cycle.

(3 marks)

(c) Analyze how to overcome shrinkage from occur in molding.

(6 marks)

Q5 (a) Would you use thermosetting plastics for injection molding? Explain.

(4 marks)

(b) Mentioned the reasons why the plastic shaping processes are important.

(5 marks)

(c) Discuss **three (3)** of the defects that can occur in plastic injection molding.

(6 marks)

SECTION B

Q6 A slab milling operation is performed to finish the top surface of a steel rectangular workpiece 14.0 in long by 3.0 in wide. The helical milling cutter, which has a 4.0 in diameter and ten teeth, is set up to overhang the width of the part on both sides. The cutting speed is 130 ft/min, the chip load is 0.006 in/tooth, and the depth of cut is 0.5 in. Determine:

(a) the time to make one pass across the surface,

(6 marks)

(b) the maximum metal removal rate during the cut,

(7 marks)

(c) if there is a need to improve surface finish of the machined part, what would you recommend?

(7 marks)

Q7 (a) 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 of 65 minutes. Using Taylor's equation, determine the related constant.

(10 marks)

(b) Tool life tests in turning yield the following data:
First test: $v = 100$ m/min, $T = 10$ min;
Second test: $v = 75$ m/min, $T = 30$ min.

(i) Determine the n and C values in the Taylor tool life equation.
(ii) Based on your equation, compute the tool life for a speed of 90 m/min.
(iii) Based on your equation, compute the speed corresponding to a tool life of 20 min.

(10 marks)

Q8 The total solidification times of three casting shapes are to be compared:
First shape: sphere,
Second shape: cylinder, in which the length-to-diameter ratio = 1.0
Third shape: cube. For all three geometries, the volume =1000 cm3.
The same casting alloy is used in the three cases.

(a) Determine the relative solidification times for each geometry.

(4 marks)

(b) Based on the results of part (a), which geometric element would make the best riser.

(8 marks)

(c) If the mold constant equals 3.5min/cm^2 in Chvorinov's rule, compute the total solidification time for each casting.

(8 marks)

-END OF QUESTION-