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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2018/2019**

COURSE NAME : MANUFACTURING TECHNOLOGY
COURSE CODE : BDA 30502
PROGRAMME : 3 BDD
EXAMINATION DATE : DECEMBER 2018 / JANUARY 2019
DURATION : 2 HOURS
**INSTRUCTION : 1. ANSWER ALL QUESTION
FROM SECTION A
2. ANSWER TWO (2) QUESTIONS
FROM SECTION B**

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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SECTION A

- Q1**
- (a) Manufacturing in its comprehensive sense, is the process of converting raw materials into finished products. Every industry has been designed to have specific manufacturing capabilities to fulfill the production requirement. List and explain **TWO (2)** main manufacturing capabilities that typically involved in the manufacturing company.
(5 marks)
 - (b) Product design in molding process is one of the factors that have to be taken into consideration by the designer to ensure the capability of the process in producing the product. Develop product design guidelines that can be utilized by the designer to produce plastic parts in molding process.
(10 marks)
 - (c) An alloy sprocket as **Figure Q1(c)** will be manufactured by powder metallurgy process. What are the necessary usual powder metallurgy production sequence to be carried out in order to produce the alloy sprocket? Argue your decision.
(10 marks)
- Q2**
- (a) Distinguish **FOUR (4)** differences between thermite welding and resistance welding in terms of principle and applications with the aid of sketches.
(8 marks)
 - (b) If you are designing a joint that needs to be strong and yet needs to be disassembled a few times during the product life, propose and explain the kind of joint you would choose.
(5 marks)
 - (c) Point out the circumstances where brazing or soldering is preferred over welding.
(4 marks)
 - (d) The molten filler metal in Brazing is distributed throughout the joint by capillary action. Define capillary action.
(4 marks)
 - (e) Explain weldability of steel change as its carbon content increases.
(4 marks)

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SECTION B

- Q3** (a) Material removal processes such as machining/traditional machining are desirable and necessary in manufacturing operation. Describe the advantages and disadvantages of machining/traditional machining. (7 marks)
- (b) In Merchant theory, there are specific assumptions for orthogonal cutting and oblique cutting. Differentiate **FOUR (4)** properties of orthogonal and oblique cutting. (8 marks)
- (c) A 150mm long with 12.5mm in diameter of a stainless steel rod is being reduced in diameter to 12.0mm using a lathe machine. The machine spindle rotates at $N=400$ rpm, and tool is traveling at an axial speed of 200mm/min. Determine the cutting speed, material removal rate, and cutting time. (10 marks)
- Q4** (a) With the help of sketches, differentiate between open molds and closed molds. Explain the function of a core in casting process and how to implement it. (7 marks)
- (b) By referring to **Figure Q4(b)**, what is the appropriate casting process to produce this castings component with high accuracy of dimension and mass quantity? Use illustration to explain the process involved to make the component. (8 marks)
- (c) i) A steel rectangular plate with dimensions of 650 mm length x 105 mm width x 15 mm thick, will be produced using sand-casting. If the mold constant is 3.26 min/cm^2 , calculate the total solidification time required for the casting to solidify after pouring. (4 marks)
- ii) After the plate solidified, it was found that the plate has defects. By the aid of sketch, distinguish **FOUR (4)** common types of defects that might occurred in sand casting. State the cause of each defect. (6 marks)

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- Q5** (a) List and sketch the **SEVEN (7)** type of rolling processes. (7 marks)
- (b) Impression die forging and flashless forging is one of the important sheet metal forming practice. Draw a flash problem and give **THREE (3)** comparisons. (8 marks)
- (c) **Figure Q5(c)** shows a metal forming product that crucial to get a uniform wall thickness on the side wall.
- i. Name the suitable metal tooling forming process for the product.
 - ii. Sketch and label the process with explanation (10 marks)

END OF QUESTION

FINAL EXAM

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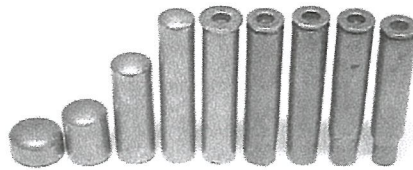
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Figure Q1(c)



Figure Q4 (b)



Parts courtesy of RemingtonArms.

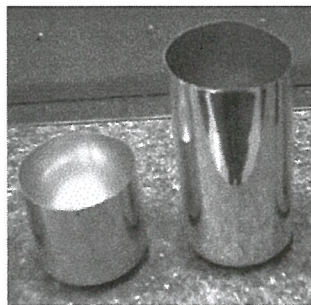


Figure Q5 (c)

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