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**UNIVERSITI TUN HUSSEIN ONN  
MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2019/2020**

COURSE NAME : MANUFACTURING TECHNOLOGY  
COURSE CODE : BDA 30502  
PROGRAMME : 3 BDD  
EXAMINATION DATE : DECEMBER 2019 / JANUARY 2020  
DURATION : 2 HOURS  
INSTRUCTION :  
1. ANSWER **ONE** QUESTION  
FROM **SECTION A**  
2. ANSWER **ALL** QUESTIONS  
FROM **SECTION B**

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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**SECTION A**

**Q1** (a) Write at least **THREE (3)** sector industry area and discuss some of the reasons why machining is commercially important. (7 marks)

(b) Examine **FOUR (4)** advantages and disadvantages of machining on scope of industries. (8 marks)

(c) A slab milling operation is performed to finish the top surface of a steel rectangular work piece 250 mm long by 70 mm wide. The helical milling cutter, which has a 80 in diameter and eight teeth, is set up to overhang the width of the part on both sides. Cutting conditions are:  $v = 50$  m/min,  $f = 0.12$  mm/tooth, and  $d = 3.00$  mm.

Calculate:

- i. The time to make one pass across the surface
- ii. The material removal rate during cutting process

(10 marks)

**Q2** (a) In turning operation, **FIVE (5)** basic cutting techniques have been used widely in industry to perform shape and contour. Illustrate in Figure and label completely. (5 marks)

(b) In machining cutting tool theory, there is **TWO (2)** methods of cutting called Orthogonal cutting and Oblique cutting that widely used in industries. Compare at least **FOUR (4)** assumptions between these twos (8 marks)

(c) A company made an investigation of single point tool of their machining department. They found a majority of the problems are tool failure obviously occurred during the cutting process.

- i. Discuss **THREE (3)** mode of failures
- ii. Draw a diagram of tool failure/wear
- iii. Examine and suggest an option to reduce tool failure during machining.

(12 marks)

- Q3** (a) One of the most useful casting technique have been invented called permanent mold casting. Sketch **THREE (3)** important parts and list **TWO (2)** products example from the process. (5 marks)
- (b) Illustrate **TWO (2)** advantages and disadvantages for sand casting and investment casting. (8 marks)
- (c) Select the suitable metal casting process in order to produce the casting component shown in **Figure Q3 (c)**.
- (i) Analyze **FOUR (4)** reasons why you have selected this casting process.
- (ii) Explain how this component can be produced by the selected casting process. (12 marks)

**SECTION B**

- Q4** (a) With the aid of sketch, differentiate the types of dies in forging process. (9 marks)
- (b) Choose and explain the suitable process to produce a copper wire as shown in **Figure Q4 (b)**. (6 marks)
- (c) There is a limitations for a manufacturer to '*do and don't*' in producing a plastics product. Appraise a general product design guidelines related to plastics shaping process. (10 marks)
- Q5** (a) Motorcycle sprocket/gear usually required to be produced as a mass production. With aid of diagram, explain the sequences of the process to produce the part as shown in **Figure Q5 (a)**. (11 marks)
- (b) Based on your answers on **Q5 (a)**, justify why the selection process is ideal to produce a gear/sprocket. (4 marks)

- Q5** (a) Motorcycle sprocket/gear usually required to be produced as a mass production. With aid of diagram, explain the sequences of the process to produce the part as shown in **Figure Q5 (a)**.  
(11 marks)
- (b) Based on your answers on **Q5 (a)**, justify why the selection process is ideal to produce a gear/sprocket.  
(4 marks)
- (c) Powder metallurgy process is a term covering a wide range of ways in which materials or components are made from metal powders. Appraise why powder metallurgy is considered as one of the important in manufacturing process.  
(10 marks)
- Q6** (a) Choose a suitable joining process to repair a large crack on railroad rails and explain the process.  
(6 marks)
- (b) Differentiate **TWO (2)** categories of welding process.  
(6 marks)
- (c) Weldability is a capacity of a metal or combination of metals to be welded into a suitably designed structure, and for the resulting weld joint(s) to possess the required metallurgical properties to perform satisfactorily in intended service. Determine the factors that affecting the weldability of welding process.  
(8 marks)
- (d) Justify why design for assembly is required to be considered in welding operation.  
(5 marks)

- END OF QUESTION -



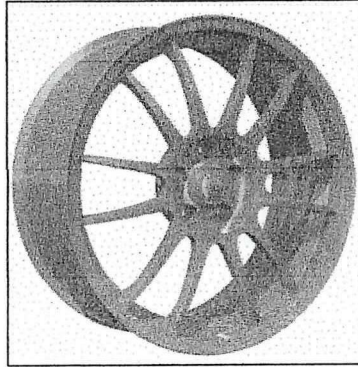
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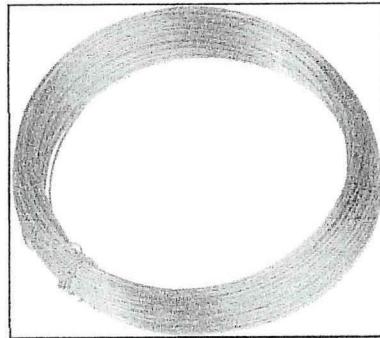
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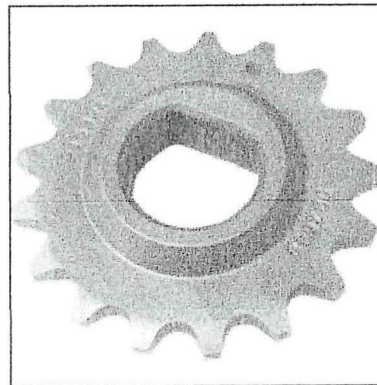
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**Figure Q3 (c)**



**Figure Q4 (b)**



**Figure Q5 (a)**

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