



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2022/2023**

- COURSE NAME : MANUFACTURING TECHNOLOGY
- COURSE CODE : BDA 31403
- PROGRAMME CODE : BDD
- EXAMINATION DATE : FEBRUARY 2023
- DURATION : 3 HOURS
- INSTRUCTION
1. ANSWER **FIVE (5)** QUESTIONS **ONLY** FROM **SIX (6)** QUESTIONS
 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSE BOOK**
 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

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- Q1** (a) There are **FOUR (4)** types of material used in manufacturing engineering. List and describe an example of the products that used for each elements. (10 marks)
- (b) List **TWO (2)** categories of casting processes. Discuss the advantages and disadvantages of these processes. (10 marks)
- Q2** (a) With the help of appropriate diagrams, differentiate between open mold and closed molds. (6 marks)
- (b) Discuss **FOUR (4)** properties that are required in moulding sand. (4 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. (6 marks)
- ii. Examine and suggest an option to reduce tool failure during machining. (4 marks)
- Q3** Bulk deformation processes are generally characterized by significant deformations and massive shape changes, and the surface area to volume of the work is relatively small. The **Figure Q3** illustrates different bulk deformation processes.
- (a) Fill in the blank and elaborate on the process description (8 marks)
- (b) Discuss **FOUR (4)** major drawbacks of hot working. (4 marks)
- (c) Elaborate the term Extrusion Process with the proper figure (8 marks)
- Q4** Plastics are the most common materials for producing end-use parts and products, for everything from consumer products to medical devices. There are a variety of methods used to process plastic. Each method has its advantages and disadvantages and is better suited for specific applications.
- (a) Plastics are broadly classified into thermo-plastics and thermo-setting plastics. Differentiate these terms. (6 marks)

- (b) Compare thermo-plastics and thermo-setting plastics with reference to its characteristic. (8 marks)
- (c) Injection moulding is the most widely used polymeric fabrication process. With reference to the **Figure Q4 (c)**, elaborate on the **THREE (3)** main stages in the injection moulding process.
- i. Injection of the plastic melts into the mould
 - ii. Holding pressure and plasticating
 - iii. Ejection
- (6 marks)
- Q5 (a)** Motorcycle sprocket/gear usually required to be produced in a large quantity of numbers. Select the most sustainable of manufacturing method to mass produce the part as shown in **Figure Q5 (a)** and explain the sequences of the process (10 marks)
- (b) Based on your answers on question Q5 (a), justify **TWO (2)** reasons 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 **THREE (3)** reasons why powder metallurgy is considered as one of the important in manufacturing process. (6 marks)
- Q6 (a)** Illustrate the friction welding process with the aid of sketch and explanation. (10 marks)
- (b) 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 **THREE (3)** factors that affecting a weldability of welding process. (6 marks)
- (c) Justify **TWO (2)** reasons why design for assembly is required to be considered in welding operation. (4 marks)

- END OF QUESTION -

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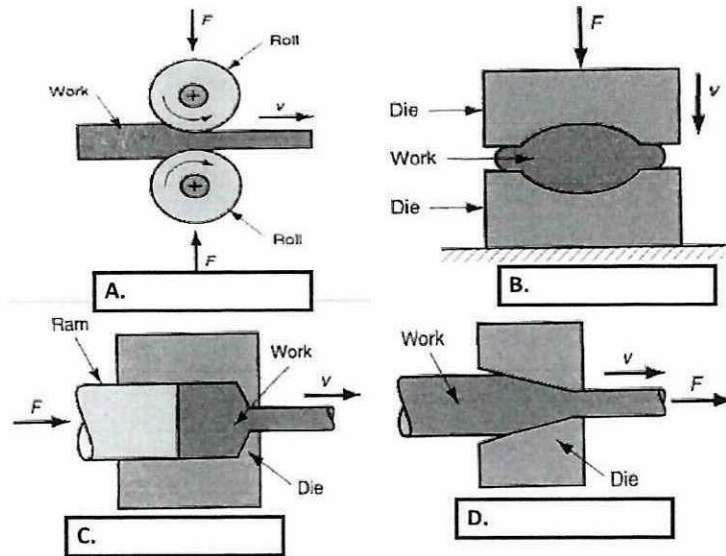


Figure Q3

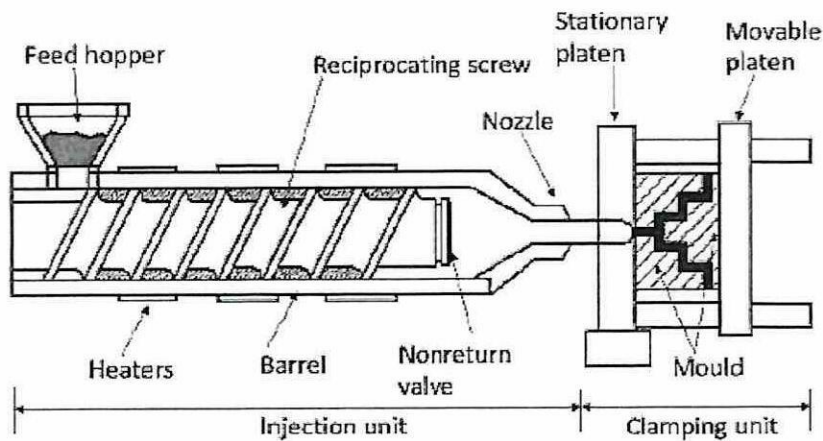


Figure Q4(c)

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Figure Q5(a)