



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2017/2018**

COURSE NAME : MANUFACTURING PROCESS
TECHNOLOGY

COURSE CODE : BNM 20103

PROGRAMME CODE : BNM/BNK

EXAMINATION DATE : JUNE/JULY 2018

DURATION : 2 HOURS 30 MINUTES

INSTRUCTION : ANSWER ALL QUESTIONS

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THIS QUESTION PAPER CONSIST OF **THREE (3)** PAGES

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- Q1**
- (a) Sand casting is an example of expandable mold and permanent pattern type of casting process. Differentiate expandable mold and permanent mold. (6 marks)
 - (b) Revise **FOUR (4)** properties of sand mold that need to be put into consideration when designing sand casting process in order to get the required quality of casting. (8 marks)
 - (c) Based on **Q1(b)**, select **ONE (1)** properties answered. With the aid of proper sketching, predict on how possible casting defects occurred. (6 marks)
- Q2**
- (a) Give **TWO (2)** disadvantages of hot working process. (2 marks)
 - (b) With the aid of proper sketching, compare the process of forging and extrusion. (6 marks)
 - (c) Differentiate **THREE (3)** properties between edge bending and V-bending of sheet metal. (6 marks)
 - (d) Recommend **THREE (3)** steps on manufacturing need to be done as alternative to promote sustainability. (6 marks)
- Q3**
- (a) Predict **FOUR (4)** classification of shaping process for plastics. (4 marks)
 - (b) An injection molding machine comprises of injection unit and clamping unit. Revise **THREE (3)** points the functions of clamping unit. (6 marks)
 - (c) Shrinkage is defined as the reduction of size, linearly, during cooling from molding to room temperature. Shrinkage allowance need to be considered when designing a mold. Construct **FOUR (4)** steps on how shrinkage can be reduced during plastics injection molding process. (10 marks)

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- Q4** (a) Describe **TWO (2)** types of powder metallurgy production sequences. (4 marks)
- (b) Powder Metallurgy parts can be mass produced to net shape or near net shape and the need for subsequent machining can be reduced. However, this process has some limitations. Analyze the limitations of powder metallurgy process. (6 marks)
- (c) Mr. Bali Bey owns a factory making automotive components such as gears, bushes, rotors and sprockets. He received a new job for making a series of gears for the new Perodua Myvi. The demand is so huge and he believes that the company needs to implement the powder metallurgy process. As a production engineer, invent ideas on how Mr. Bali Bey can implement the process in his factory. (10 marks)
- Q5** (a) List **TWO (2)** types of welding processes. (2 marks)
- (b) Predict **FOUR (4)** importance of welding process. (8 marks)
- (c) Solid state welding is a welding process, in which two work pieces are joined under a pressure providing an intimate contact between them and at a temperature essentially below the melting point of the parent material. Bonding of the materials is a result of diffusion of their interface atoms. Investigate how the solid state welding is suitable for automotive manufacturers. (10 marks)

- END OF QUESTIONS -