



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

COURSE NAME : MANUFACTURING
PROCESS TECHNOLOGY

COURSE CODE : BNM 20103

PROGRAMME CODE : BNM

EXAMINATION DATE : JUNE / JULY 2019

DURATION : 2 HOURS 30 MINUTES

INSTRUCTION : ANSWER ALL QUESTIONS

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

- Q1** (a) List down **TWO (2)** factors that influence the fluidity in metal casting. Then, briefly describe both factors given. (4 marks)
- (b) Sand casting is an example of expandable mold and permanent pattern type of casting process. Differentiate expandable mold and permanent mold. (4 marks)
- (c) Discover **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)
- (d) Based on **Q1(c)**, select **ONE (1)** properties answered. With the aid of proper sketching, explain why would be the possible casting defect. (4 marks)
- Q2** (a) Outline **TWO (2)** disadvantages of hot working process. (2 marks)
- (b) Deformation processes can be conveniently classified into bulk-forming processes and sheet-forming processes. In both cases, the surfaces of the deforming material and of the tools are usually in contact, and friction between them has a major influence. Rolling, forging, extrusion and drawing are bulk forming processes. Based on the statement, compare the process of forging and extrusion in bulk deformation processing methods include the sketch of the process with proper label. (8 marks)
- (c) Differentiate between edge bending and V-bending of sheet metal forming. (4 marks)
- (d) Propose **THREE (3)** steps for manufacturing sectors that need to be done as alternative to promote sustainability. (6 marks)

- Q3** (a) List **THREE (3)** classification of shaping process for plastics. (3 marks)
- (b) Explain why the shaping process for plastics are important and favoured by most industry. (4 marks)
- (c) An injection molding machine comprises of injection unit and clamping unit. Give **THREE (3)** functions of clamping unit. (3 marks)
- (d) 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. Determine **FOUR (4)** steps on how shrinkage can be reduced during plastics injection molding process. (10 marks)

- 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. According to the statement, interpret more **THREE (3)** advantages of powder metallurgy process. (6 marks)
- (c) Mr. Adham Fendy 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 sales engineer, explain in detail how Mr. Adham Fendy can implement the process in his factory. (10 marks)

Q5 (a) Welding is joining process in which two or more parts are coalesced at their contacting surfaces by application of heat and or pressure. Many welding processes are accomplished by heat alone, with no pressure applied. Others by a combination of heat and pressure. Still others by pressure alone with no external heat. Based on the statement;

(i) List **TWO (2)** major categories in the welding process.

(2 marks)

(ii) Arc welding (AW) is one type of fusion welding process. Describe AW based on your knowledge.

(2 marks)

(iii) Demonstrate **THREE (3)** defects in AW welding process with the related sketch.

(6 marks)

(b) 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. Determine how the solid state welding is suitable for automotive manufacturers.

(10 marks)

-END OF QUESTIONS -