

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA****FINAL EXAMINATION  
SEMESTER II  
SESSION 2016/2017**

COURSE NAME : MANUFACTURING PROCESS  
TECHNOLOGY

COURSE CODE : BNM 20103

PROGRAMME CODE : BNM/BNK

EXAMINATION DATE : JUNE 2017

DURATION : 3 HOURS

INSTRUCTION : ANSWER FIVE (5) QUESTIONS ONLY

THIS QUESTION PAPER CONSIST OF FIVE (5) PAGES

- Q1** (a) As an engineer, you are required to design a suitable layout for mass assembly process of portable printer.
- (i) Explain in detail the consideration in selecting the suitable process layout. (4 marks)
- (ii) With the aid of sketch, describe the suitable process layout for this production process. (6 marks)
- (b) Considering two materials of plastic and stainless steel to be used for food container, propose at least **FIVE (5)** considerations to be taken into account in selection of suitable material. (10 marks)
- Q2** (a) Material removal processes such as machining/traditional machining are desirable and necessary in manufacturing operation. List out the advantages and disadvantages of machining/traditional machining. (4 marks)
- (b) Illustrate **FOUR (4)** basic types of chip in machining and for each type give **ONE (1)** reason why it is happen. (6 marks)
- (c) A 150 mm long with 12.5 mm in diameter of a stainless steel rod is being reduced in diameter to 12 mm using a lathe machine. The machine spindle rotates at 400 rpm, and tool is traveling at an axial speed of 200 mm/min. Evaluate the cutting speed, material removal rate, and cutting time. (10 marks)
- Q3** (a) Define "Casting" in the context of manufacturing process. (2 marks)
- (b) Describe **TWO (2)** important properties of molding sand in metal casting process. (4 marks)
- (c) Distinguish the differences between Hot-Chamber Die Casting and Cold-Chamber Die Casting in Permanent Mold Casting process. Provide sketches and figures to support your answer. (8 marks)

- (d) **Figure Q3(d)** illustrates the types of casting defect that has contributed high reject rates to Aluminium Alloy Casting Sdn. Bhd. in their alloy wheel products. As a new appointed technology engineer, you have been assigned to reduce the reject rates by minimizing the defects. Analyse the causes of the defects and propose possible countermeasures that can be composed by the company.
- (6 marks)
- Q4** (a) Describe the differences between Thermoplastics and Thermosets materials in the shaping processes of plastics.
- (2 marks)
- (b) With the aid of sketches, illustrate and describe the sequence of Injection Molding Cycle to produce complex and intricate plastic shape products for automotive industries.
- (8 marks)
- (c) 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)
- Q5** (a) With the aid of sketch, explain the differences between indirect extrusion and bar drawing process.
- (6 marks)
- (b) Crack that present on the as-cold forged (flashless forging) product due to the work hardening can cause to the product rejection.
- (i) Describe the work hardening process.
- (4 marks)
- (ii) Propose the possible solutions to overcome the formation of crack on the product.
- (10 marks)
- Q6** (a) Explain **FOUR (4)** reasons on why joining process is important.
- (4 marks)
- (b) Differentiate thermite welding and resistance welding in term of principle and applications.
- (8 marks)

- (c) An alloy sprocket as **Figure Q6(d)** will be manufactured by powder metallurgy process. Plan the necessary usual powder metallurgy production sequence to be carried out in order to produce the alloy sprocket.

(8 marks)

- END OF QUESTIONS -

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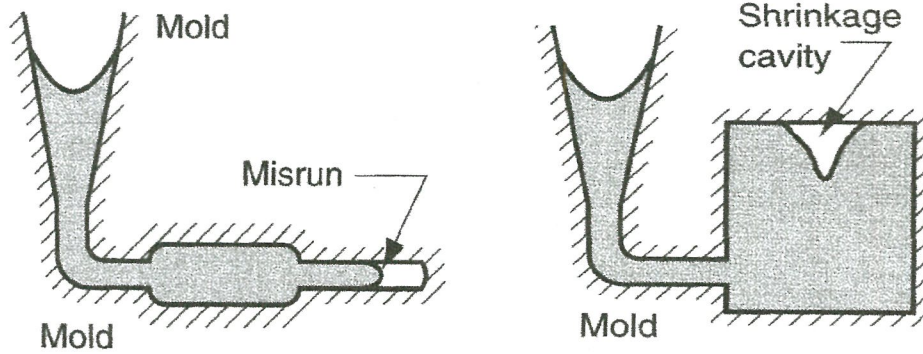


Figure Q3(d)

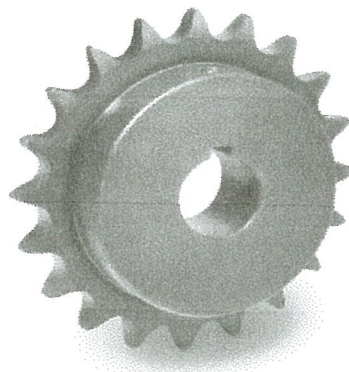


Figure Q6(d)