UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(ONLINE)
SEMESTER I
SESSION 2020/2021

COURSE NAME	: MANUFACTURING PROCESS
COURSE CODE	: DAM11002
PROGRAMME CODE	: DAM
EXAMINATION DATE	: JANUARY 2020 / FEBRUARY 2020
DURATION	: 2 HOURS 30 MINUTES
INSTRUCTION	: 1) ANSWER **FOUR (4)** QUESTIONS ONLY 2) THE STUDENTS SHOULD UPLOAD THE ANSWER BOOKLET (PDF FORMAT) WITHIN 15 MINUTES AFTER EXAMINATION PERIOD.

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

(c) The foreman in the injection molding department says that a polyethylene part produced in one of the operations has greater shrinkage than the calculations indicate it should have. The important dimension of the part is specified as 112.5 ±0.25 mm. However, the actual molded part measures 112.02 mm. If the shrinkage value for polyethylene is 0.025 and the first step to solve the problem is by using the correct mold dimension:-

(i) Find the correct value of the mold dimension.

(4 marks)

(ii) If the foreman does not want to change the mold dimension, suggest **THREE (3)** adjustments in process parameters and the reason that could be made to reduce the amount of shrinkage.

(9 marks)

Q3 (a) Explain the fundamental difference between a fusion weld and a solid-state weld.

(7 marks)

(b) Explain the advantages and disadvantages of welding.

(4 marks)

(c) Name and sketch **FIVE (5)** joint types.

(10 marks)

(d) The power source in a particular welding operation generates 125 Btu/min, which is transferred to the work surface with an efficiency f1 = 0.8. The melting point for the metal to be welded Tm =1800°F and it's melting efficiency f2 = 0.5. A continuous fillet weld is to be made with a cross-sectional area Aw = 0.04 in^2. Find the travel speed at which the welding operation can be accomplished.

(9 marks)

Q4 (a) What is powder metallurgy?

(2 marks)

(b) Give **THREE (3)** reason why the powder metallurgy technology is important.

(6 marks)

(c) Explain the **THREE (3)** methods used to produce metallic powders.

(9 marks)

(d) A bearing of simple geometry is to be pressed out of bronze powders, using a compacting pressure of 207 MPa. The outside diameter of the bearing is 44 mm, the inside diameter is 22 mm, and the length of the bearing is 25 mm. Find the required press tonnage to perform this operation.

(8 marks)

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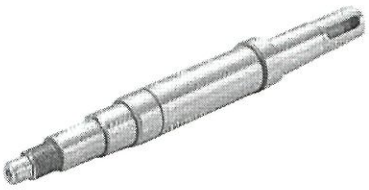

Figure Q1 (d): Rotating shaft