Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	MANUFACTURING TECHNOLOGY I
COURSE CODE	:	BDX10902
PROGRAMME	:	BDX
EXAMINATION DATE	:	JULY/AUGUST 2023
DURATION	:	2 HOURS
INSTRUCTION	:	1. ANSWER **ONE (1)** QUESTION IN **SECTION A**. ANSWER **THREE (3)** QUESTION IN **SECTION B** 2. THIS FINAL EXAMINATION IS CONDUCT CLOSE BOOK 3. STUDENT 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

SECTION A

Q1 (a) Explain in general major manufacturing process of components in aircraft below. List **ONE (1)** example of the product

i. Plastic Forming
ii. Metal casting
iii. Metal forming
iv. Composite

(8 marks)

(b) There are **FOUR (4)** keys focusing technology investment on future needs in aerospace manufacturing. Justify the key point and elaborate in your own understanding.

(8 marks)

c) Aerospace industri has been driven by "market trend" and economic perspective from the begin aircraft designed and fabricate. Discuss the market trend criteria in your point of view

(9 marks)

Q2 (a) There are three classification of major material in making an aircraft manufactured.

i. Classify each of the three categories
ii. Justify one example each categories
iii. Compare the material in their physical properties

(10 marks)

(b) Composites is one material technology developed in majority of aircraft component. Distinguish the composite material in aircraft manufacturing in term of pattern crossed layer, ingredient and short or long fibre. You may need to sketch the structure.

(7 marks)

(c) Environmental aspect is a common issue in order to maintain, repair and service on aircraft body and structure. Examine **THREE (3)** method to de-icing the aircraft body to prevent a corrosion and decaying issue.

(8 marks)

SECTION B

Q3 (a) Metal casting process can be divided into several types which need to be select based on design specifications. Compare the advantage and disadvantage between vacuum molding and investment casting.

(10 marks)

(b) Sketch the process in centrifugal casting until the parts produced. List up two advantages and disadvantages of centrifugal casting in industries

(7 marks)

(c) With the help of sketches, differentiate between open molds and closed molds. Explain the function of a core in casting process.

(8 marks)

Q4 (a) Impression die forging and flashless forging is one of the important sheet metal forming practice. Draw a flash problem and list **THREE (3)** comparisons ?

(8 marks)

(b) Discuss the advantages of extrusion process and named **4 (FOUR)** products using this technique.

(8 marks)

(c) **Figure Q4** shows a metal forming product having a crucial step to get a uniform wall thickness on the side wall.

i. Name the suitable metal tooling forming process for the product.
ii. Sketch and label the process with explanation.

(9 Marks)

Q5 (a) The criteria of sheet metal form to fabricate a fuselage and any stretching process depending on **SIX (6)** categories. Justify the categories and elaborate your answer.

(6 marks)

(b) Hot forming process including superplastic forming (SFP) either alone or in combination with diffusion bonding (DB) and hot die forming process commonly used to fabricate titanium sheet metal part. These will enhance the performance of aircraft. Support this statement

(7 marks)

(c) Major application of formed extrusion includes wing stiffeners, channel vents, spar chords, fuselage frames and body chords. With the help of sketches, analyze **THREE (3)** fundamentals process involve in stretch forming.

(12 marks)

- END OF QUESTION –

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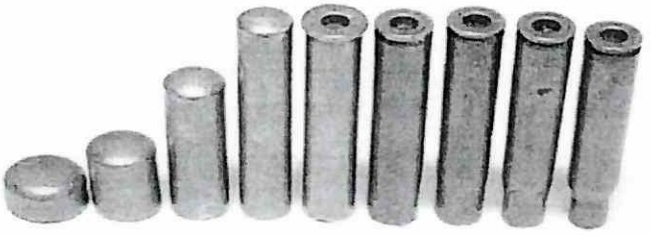

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