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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(ONLINE)
SEMESTER I
SESSION 2020/2021**

COURSE NAME : JIGS AND FIXTURE DESIGN
COURSE CODE : BDX 20102
PROGRAMME CODE : BDX
EXAMINATION DATE : JANUARY/FEBRUARY 2021
DURATION : 2 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS IN SECTION
A. ANSWER **TWO (2)** FROM **THREE (3)**
QUESTIONS IN SECTION B ONLY.

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

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SECTION A -ANSWER ALL QUESTIONS (TOTAL 50 MARKS)

- Q1** In aircraft modern manufacturing process, a tool designer must have a working knowledge of machine shop practices, tool-making procedures, machine tool design, and manufacturing procedures and methods, as well as the more conventional engineering disciplines of planning, designing, engineering graphics and drawing, and cost analysis
- (a) Define **FOUR(4)** aircraft tool’s design objectives. (8 marks)

 - (b) Describe **FOUR (4)** factors that influence the tool design choices. (8 marks)

 - (c) Explain **THREE (3)** tool designer’s responsibility. (9 marks)
- Q2**
- (a) With the aid of diagram, sketch and explain the six points location principle. (10 marks)

 - (b) Describe what is foolproofing and verification. (3 marks)

 - (c) With the aid of diagram, differentiate the **THREE (3)** basic cam types used for clamping mechanism. (12 marks)

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SECTION B - ANSWER TWO (2) FROM THREE (3) QUESTIONS (TOTAL 50 MARKS)

- Q3** (a) Distinguish a fixture of aircraft component for milling and grinding process, by providing the figures of the fixtures, work piece/product and the function of each fixtures.
(10 marks)
- (b) Design one plate fixture specifically for an aircraft component, by providing a diagram, part drawing, production plan, locating of part and **ONE (1)** example of cam clamps calculation.
(15 marks)
- Q4** (a) Differentiate between standard gauges and special gauges with proper examples and figures.
(10 marks)
- (b) Compare the gauging and measuring fixtures by providing the diagram and the inspection process.
(10 marks)
- (c) Provide **ONE (1)** example of wear allowance for plug gauges.
(5 marks)
- Q5** (a) Appraise the use of modular fixtures over conventional tooling.
(10 marks)
- (b) Explain how CAD/CAM application helps in designing jigs and fixtures.
(5 marks)
- (c) List **FIVE (5)** objectives of designing fixtures for welding operations related to aircraft manufacturing process.
(5 marks)
- (d) With the aid of diagram, provide basic design consideration of fixtures for welding operations.
(5marks)

-END OF QUESTION

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