

SULIT



Second Semester Examination
2022/2023 Academic Session

July/August 2023

EEM354 – Manufacturing Management And Technology

Duration : 2 hours

Please check that this examination paper consists of **FIVE (5)** pages of printed material including appendix before you begin the examination.

Instructions : This paper consists of **FOUR (4)** questions. Answer **THREE (3)** questions.

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1. (a) Define the term Manufacturing System. Illustrate the definition in larger production system.

(20 marks)

- (b) What is the difference between a process layout and a product layout in a production facility? Give example of production for each layouts.

(40 marks)

- (c) A manual assembly line is being planned for a product whose annual demand = 90,000 units. A continuously moving conveyor will be used with work units attached. Work content time = 55 min. The line will run 50 wk/yr, 5 shift/wk, and 8 hr/day. Each worker will be assigned to a separate workstation. Based on previous experience, assume line efficiency = 0.95, balancing efficiency 0.93, and repositioning time = 9 sec. Determine (a) hourly production rate to meet demand, (b) number of workers and workstations required, and (c) for comparison, the ideal minimum value as given by

$$w_{min} = \text{Minimum Integral} \geq \frac{\text{Work of content time}}{\text{Production time}}$$

(40 marks)

2. (a) What are the advantages of a mixed model line over a batch model line for producing different product styles?

(30 marks)

- (b) Determine FIVE common anatomies of commercial industrial robots with illustration of positioning and orientation. Give example of application on each anatomies.

(30 marks)

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- (c) Given that annual demand for a product is 20,000 units, cost per unit = RM 6.00, holding cost rate = 2.5%/month, changeover (setup) time between products averages 2.0 hours, and downtime cost during changeover = RM 200/hour, determine (i) economic order quantity and (ii) total inventory cost for this situation.

(40 marks)

3. (a) Describe THREE classifications of Manufacturing Industries?

(20 marks)

- (b) Explain the details of Process Planning?

(20 marks)

- (c) A product is made to stock. Annual demand is 40,000 units, each unit cost = RM 10.50, holding cost rate = 20%/month, changeover (setup) time between products averages 2.0 hours, and downtime cost during changeover = RM 100/hour, determine

- i. Economic order quantity

(30 marks)

- ii. Total inventory cost for this situation

(30 marks)

4. (a) Explain the liquid-based method on the form of the starting material in Rapid Prototyping process.

(20 marks)

- (b) List the application issues in Rapid Prototyping and give the reason why it happens?

(20 marks)

- (c) Briefly explain the preparation of the Silicon substrate process below.

- i. Crystal Growing

(30 marks)

- ii. Shaping of Silicon into Wafers

(30 marks)

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APPENDIX

Question	Course Outcome (CO)	Programme Outcome (PO)
1	1	PO2
2	2	PO3
3	3	PO3
4	4	PO4