

UNIVERSITI KUALA LUMPUR  
MALAYSIAN INSTITUTE OF INDUSTRIAL TECHNOLOGY

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**SPECIAL EXAMINATION**  
**JANUARY 2016 SEMESTER**

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**COURSE CODE** : JQD 21702  
**COURSE TITLE** : FUNDAMENTAL OF INDUSTRIAL  
ENGINEERING  
**PROGRAMME LEVEL** : DIPLOMA  
**DATE** : 30 MAY 2016  
**TIME** : 2.30 PM – 5.30 PM  
**DURATION** : 3 HOURS

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**INSTRUCTIONS TO CANDIDATES**

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1. Please read the instructions given in the question paper **CAREFULLY**.
  2. This question paper is printed on both sides of the paper.
  3. This question paper consists of **TWO (2)** sections. Section A and B.
  4. Answer **ALL** questions in Section A. Choose **TWO (2)** questions in Section B.
  5. Please write your answers on the answer booklet provided.
  6. Please answer all questions in the English language only.
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**THERE ARE 4 PAGES OF QUESTIONS EXCLUDING THIS PAGE.**

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**SECTION A (Total: 60 marks)****INSTRUCTION: Answer ALL questions****Please use the answer booklet provided****Question 1**

Industrial Engineering is the branch of engineering that deals with the creation and management of systems that integrate people, materials, equipment and energy in productive ways.

- i. List-out two (2) main contributions of Frank Gilbreth in the development of Industrial Engineering? (4 marks)
- ii. In manufacturing, list out (3) main roles and function of industrial engineers? (6 marks)
- iii. Explain the concept of Kaizen in manufacturing setting. (6 marks)
- iv. If an operator works at 95% productivity level, how many units of calculator he/she will be able to produce in 7-hrs shift, given the standard time is 150 sec? (4 marks)

**Question 2**

- i. Explain why overproduction is regarded as the worst of manufacturing waste. (6 marks)
- ii. List out two (2) Principle of Motion Economy on the "arrangement of work place". (4 marks)
- iii. There are many approaches that can be used to develop time standard. Discuss the methods on how the IE develop an engineered time standard. (10 marks)

**Question 3**

- i. In manufacturing flow, explain what is meant by "pull system" (6 marks)
  
- ii. Suggest two (2) conditions when cell production system is more preferable compared to conveyor production system. (6 marks)
  
- iii. Explain what is meant by LMHV production? (4 marks)
  
- iv. Suggest what production system is preferable when running LMHV production. (4 marks)

SECTION B (Total: 40 marks)

INSTRUCTION: Answer TWO (2) questions only  
 Please use the objective answer sheet provided.

Question 4

- i. Explain the purpose of using Line Balancing chart. (6 marks)
- ii. Analyses the below Line Balancing chart, then determine the following:
  - a) The production line "takt time" (3 marks)
  - b) Maximum output can be achieved by the line. (3 marks)
  - c) Estimated the percentage of line balancing loss. (2 marks)
  - d) Proposed two (2) recommendation how to improve the line balancing. (6 marks)

Production shift = 7 hrs/shift; Break time = 30 min; Required Output = 500pcs/ shift

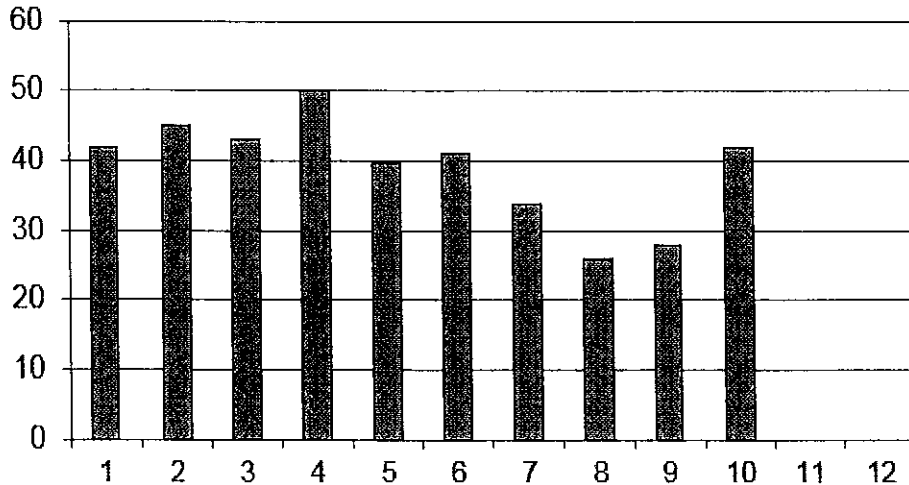
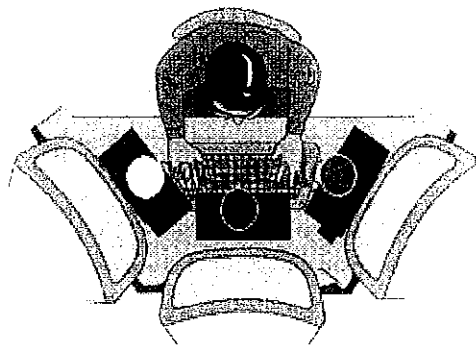


Figure 1: Line Balancing Chart

**Question 5**

- i. Explain the condition that required a Man and Machine chart need to be used. (8 marks)
  
- ii. Based on the below man and machine process details, draw a Man and Machine Chart. Then analyses and explain the finding. (12 marks)



Load = 20 sec  
 Machine time= 70 sec  
 Unload = 10 sec

Load = 30 sec  
 Machine time= 80 sec  
 Unload = 20 sec

Load = 10 sec  
 Machine time= 90sec  
 Unload = 20 sec

Figure 2: The set-up on Man and Machine requirements.

**Question 6**

- i. List-out three (3) objectives of performing Facilities Planning. (6 marks)
  
- ii. Explain the concept of "Process Layout" in manufacturing plant. (4 marks)
  
- iii. Suggest the most suitable production layout to be used for manufacturing automobile. Explain and defend your answer. (6 marks)
  
- iv. In determining the requirement for a facility and its layout, list-out the two (2) most important considerations. (4 marks)

**END OF EXAMINATION PAPER**

