UNIVERSITI KUALA LUMPUR
MALAYSIAN INSTITUTE OF INDUSTRIAL TECHNOLOGY

FINAL EXAMINATION
JANUARY 2016 SEMESTER

COURSE CODE : JQD 21702
COURSE TITLE : FUNDAMENTALS OF INDUSTRIAL ENGINEERING
PROGRAMME LEVEL : DIPLOMA
DATE : 25 MAY 2016
TIME : 9.00 AM – 12.00 PM
DURATION : 3 HOURS

INSTRUCTIONS TO CANDIDATES

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.
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. Table and formula are enclosed as reference.
7. Please answer all questions in English only.

THERE ARE 4 PAGES OF QUESTIONS EXCLUDING THIS PAGE.
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 Frederick Taylor in the development of Industrial Engineering? (4 marks)

ii. In manufacturing, list out **THREE (3)** main roles and function of industrial engineers? (6 marks)

iii. Explain **THREE (3)** basic rules when calculating productivity? (6 marks)

iv. If an operator works at 105% productivity level, how many units of calculator he/she will be able to produce in 8-hrs shift, given the standard time is 200 sec? (4 marks)

Question 2

i. List out **THREE (3)** most important types of manufacturing waste. (6 marks)

ii. List out **TWO (2)** Principle of Motion Economy on the “use of human body” (4 marks)

iii. There are **THREE (3)** approaches that can be used to develop time standard. Explain the three methods on how the IE develop an engineered time standard. (10 marks)
Question 3

i. In manufacturing flow, explain what is meant by “push system”  
   (6 marks)

ii. Suggest TWO (2) conditions when conveyor system is more preferable compared to cell production system.  
    (6 marks)

iii. Explain what is meant by HMLV production?  
     (4 marks)

iv. Suggest what production system is preferable when running HMLV 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 Man and Machine Chart. (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  Load = 30 sec  Load = 20sec
Machine time = 70 sec  Machine time = 80 sec  Machine time = 90 sec
Unload = 10 sec  Unload = 20 sec  Unload = 10 sec

Question 5

i. Explain the purpose of using stopwatch Continuous Time Study. (8 marks)

ii. Based on the below Time Study Chart, determine the standard time. (12 marks)

CONTINUOUS TIME STUDY

<table>
<thead>
<tr>
<th>ELEMENT DESCRIPTION</th>
<th>OBSERVATIONS</th>
<th>TOTAL TIME OBS</th>
<th>AVERAGE TIME</th>
<th>RATING</th>
<th>LEVEL TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assembly 1</td>
<td>R 35 11 43 20 59 42 18 53</td>
<td></td>
<td></td>
<td>95%</td>
<td></td>
</tr>
</tbody>
</table>

STD ALLOWANCE (___ x 12.5%)
SPECIAL ALLOWANCE (___ x 2%)
STD MIN PER CYCLE

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Question 6

i. Explain the purpose of using Activity Relationship chart.  (8 marks)

ii. List-out the “Closeness Rating” used in the above activity relation chart.  (6 marks)

iii. Explain what are the differences in term of the application between Activity Relationship chart and From-To chart.  (6 marks)

END OF EXAMINATION PAPER