NOVEMBER 2013 EXAMINATION
DATE: 7 NOVEMBER 2013
TIME: 09H00 – 10H00 TOTAL: 50 MARKS
DURATION: 1 HOUR PASS MARK: 40%

(GW-67)
INDUSTRIAL ENGINEERING

THIS EXAMINATION PAPER CONSISTS OF 2 SECTIONS:

SECTION A: CONSISTS OF:
(i) 10 TRUE OR FALSE QUESTIONS (10 MARKS)
(ii) 5 MATCHING-STATEMENT QUESTIONS (5 MARKS)
ANSWER ALL THE QUESTIONS

SECTION B: CONSISTS OF 11 QUESTIONS (35 MARKS)
ANSWER ALL THE QUESTIONS

INSTRUCTIONS:
1. Read the following instructions carefully before answering the paper, as failure to act upon them will result in a loss of marks.
2. Write your answers in your answer book, which is provided in the exam.
3. Ensure that your name and student number are clearly indicated on your answer book.
4. Write your answers in either blue or black ink in your answer book.
5. Read each question very carefully before you answer it and number your answers exactly as the questions are numbered.
6. Begin with the question for which you think you will get the best marks.
7. Note the mark allocations for each question – give enough facts to earn the marks allocated. Don't waste time by giving more information than required.
8. You are welcome to use diagrams to illustrate your answers.
9. Please write neatly – we cannot mark illegible handwriting.
10. Any student caught cheating will have his or her examination paper and notes confiscated. The College will take disciplinary measures to protect the integrity of these examinations.
11. If there is something wrong with or missing from your exam paper or your answer book, please inform your invigilator immediately. If you do not inform your invigilator about a problem, the College will not be able to rectify it afterwards, and your marks cannot be adjusted to allow for the problem.
12. This paper may be removed from the examination hall after the examination has taken place.

NOTE: YOU WILL NEED A PENCIL AND RULER TO COMPLETE THIS EXAM.
SECTION A

ANSWER ALL THE QUESTIONS

(i) TRUE OR FALSE QUESTIONS

With regard to criteria for a good layout, state whether the following statements are True or False:

1. Maximum flexibility – Because the manufacturing industry is dynamic and changes all the time, the layout does not have to adapt to changes. (1)

2. Maximum co-ordination and integration – Because of the sequence of operations, it is not necessary for the co-ordination of machines and workstations. (1)

3. Maximum use of volume – Ensure the effective use of the width and length of a work area, as well as the height. (1)

4. Maximum visibility – It is of great importance for workers and their supervisors that visual contact is unobstructed. This is for communication and control purposes. It can also have an effect on morale if people are hidden behind pillars and around corners. (1)

5. Maximum accessibility – Because lines and workstations must be fed with work, they may be located where consumers will be attracted. This means that the company will have a permanent marketing strategy overall. (1)

6. Minimum distance – In a manufacturing business, it is crucial that the shortest route constitutes one employee completing a product, has it packed for instant delivery and continues with this cycle. (1)

7. Minimum handling – When products are handled no value is added to it, thus this handling time can be seen as unproductive time. Therefore, we can say that extra handling time caused by poor layout will result in a greater cost of product to the business. (1)

8. Minimum discomfort – It is very important that the layout of a function in the business is of maximum comfort for the workers who use the area. If the area is uncomfortable due to layout problems, it may cause low morale among workers. (1)

9. Inherent safety – Workers and their managers must feel safe in the working environment and its layout. A safe workplace has a very large motivational role to play for workers. (1)

10. Visible routes – The routes that people and materials must follow have to be clearly visible for the smooth transport of goods in the factory. (1)
(ii) MATCHING-STATEMENT QUESTIONS

Match the statements in Column B to the terms in Column A with regard to the location of a factory. Write down the answers only, for example 1. (a).

<table>
<thead>
<tr>
<th>Column A</th>
<th>Column B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. total cost</td>
<td>(a) to have a location close to the customer. It is important because of having to respond to the ever-changing needs and it enables faster delivery of goods</td>
</tr>
<tr>
<td>2. proximity to customers</td>
<td>(b) factors such as labour cost, taxes, and energy amounts. The idea is to select a site with the lowest cost</td>
</tr>
<tr>
<td>3. infrastructure</td>
<td>(c) road, rail, air and sea transportation</td>
</tr>
<tr>
<td>4. free trade zones</td>
<td>(d) a closed facility (under the supervision of the customs department) into which foreign goods can be brought without being subject to custom requirements. This means that payment of custom duties may be delayed</td>
</tr>
<tr>
<td>5. host community</td>
<td>(e) local educational facilities and the broader issue of quality of life are important issues in location decisions</td>
</tr>
</tbody>
</table>
SECTION B  
(35 MARKS)  

ANSWER ALL THE QUESTIONS

QUESTION 1
Name the four major methods for solving location problems.  

QUESTION 2
Explain the term 'plant layout'. Give two points.  

QUESTION 3
The optimum plant is generally the one that provides maximum satisfaction to all parties concerned – employees, management, and shareholders. The interests of these three parties must always be kept in mind.
Name three objectives of a plant layout.  

QUESTION 4
Identify three plant layout problems.  

QUESTION 5
Draw a diagram explaining the logistic chain with bread as the product.  

QUESTION 6
Give three advantages of a good plant layout.  

QUESTION 7
Name three types of manufacturing layouts.  

QUESTION 8
A good plant layout engineer (PLE) should have certain technical skills and personal characteristics.
Name the three technical skills required from a good plant layout engineer.  

QUESTION 9
Many good plant layout proposals have failed because the PLE lacked certain personal characteristics.

Name three personality traits of a good plant layout engineer. [3]

QUESTION 10
Briefly explain what 'routeing' is and give three examples. [4]

QUESTION 11
Identify the following templates:

(a) (b) (c) [3]

[35]

Section A: 15 marks
Section B: 35 marks
TOTAL: 50 MARKS