



UNIVERSITY OF RUHUNA

Faculty of Engineering

Mid-Semester 5 Examination in Engineering: June 2014

Module Number: ME 5315

Module Name: Production Planning and Control

[Two Hours]

[Answer all questions, each question carries five marks]

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- Q1. a) What is production planning and control? [1.0 Marks]
- b) What are the key decisions of production planning and control? [1.0 Marks]
- c) What do you mean by an Assembly Line? [1.0 Marks]
- d) Name three line balancing methods. What is the importance of using line balancing methods in an assembly line? [2.0 Marks]
- Q2. Company STAR is engaged in the assembly of a product X with the target of assembling 500 units of the product per day. The production time available per day is 450 minutes. Data regarding the elemental tasks, task times and precedence relationships are given in Table Q2.
- a) Find the cycle time of the product [1.0 Marks]
- b) Balance the product assembly line using Ranked Positional Weights Method. [3.0 Marks]
- c) Find the balance delay? [1.0Marks]
- Q3. a) Classify the types of layouts generally available in manufacturing plants. Explain those layout types briefly giving the advantages and limitations in each of them. [2.0 Marks]
- b) Potential locations A, B, and C have the cost structures as shown in Table Q3 for manufacturing a product, which is expected to sell for Rs.1,750/= per unit. Find the Most Economical location, if the expected product volume of Q units per year, where;
- i. $Q=200$
- ii. $Q=800$
- iii. $Q=2000$ [3.0 Marks]
- Q4. Consider the process type initial layout shown in Figure Q4 with unit cost matrix. Use CRAFT pairwise interchange technique to obtain the optimum layout. The flow matrix is given in the Table Q4. [5.0 Marks]

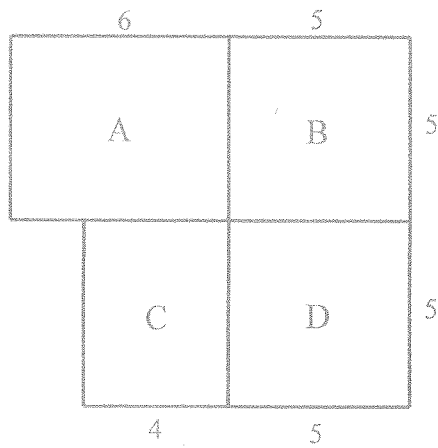


Figure Q4: Initial Layout

Table Q2

Elemental Task	Task time (s)	Predecessor task(s)
A	45	-
B	11	A
C	9	B
D	54	A
E	15	D
F	12	C
G	12	C
H	12	E
I	12	E
J	8	F,G,H,I
K	9	J

Table Q3

Site	Fixed cost / Year in (Rs.)	Variable cost/Unit in (Rs.)
A	6,000,000	1750
B	8,000,000	650
C	5,000,000	4000

Table Q4

To	A	B	C	D
From				
A	-	1	1	3
B	2	-	2	1
C	0	2	-	2
D	1	4	3	-