UNIVERSITY OF RUHUNA

Faculty of Engineering

Mid-Semester 5 **(Repeat)** Examination in Engineering: June 2015

Module Number: ME5315   **Module Name: Production Planning and Control**

[Two Hours]

[Answer **all questions**, each question carries **five** marks]

Q1. a) What is production planning and control? Why is it required in a factory?

[2.0 Marks]

b) Discuss the potential impact of each of the following may have on the design of a planning and control system.
I.   Location proximity to customers
II.   The introduction of new technology impacting the design
III.   Customers demanding fast delivery
IV.   Customers demanding low prices

[3.0 Marks]

Q2. A to G in Figure Q2 show seven workstations in a particular production line. Find the following.
a) What is the bottleneck?
b) What is the maximum production per hour?
c) What is efficiency and balance delay?
d) Group the work stations to minimize the number of work stations.
e) What is the new efficiency and balance delay?

[5.0 Marks]

Q3. a) Briefly explain the advantages and disadvantages of different types manufacturing plant layouts with examples and suitable sketches.

[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.2750/= per unit.
Find the Most Economical location, if the expected volume of Q units per year, where;
i. $Q=200$
ii. $Q=800$
iii. $Q=2000$
Draw a graph of total cost vs. product quantity for each location.

[3.0 Marks]

Q4. The data for designing a layout is shown in Figure Q4. (a) and (b). Use **CRAFT** pairwise interchange technique to obtain the optimum layout. Use unit cost matrix.
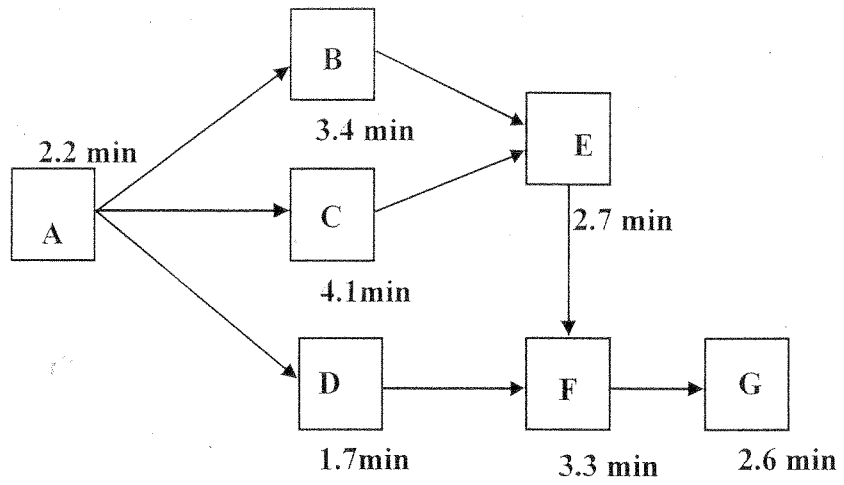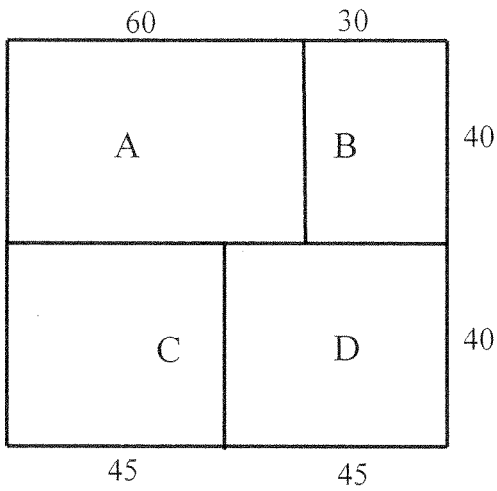
[5.0 Marks]

Figure Q2

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

(a) Initial Layout   (b) Flow Matrix

Figure Q4 Initial layout and the flow matrix

Table Q3

Site	Fixed cost / Year in (Rs.)	Variable cost/Unit in (Rs.)
A	6,000,000	1500
B	7,000,000	500
C	5,000,000	4000