IME 604

Instr: K.M.Bafna Name:_____

SAMPLE EXAMINATION

Instructions: Closed text, closed notes.

1. **Give brief (but to the point) answers to the following 8 questions. Each question is the equivalent of half a unit worth 5 points:**

a) Describe how the cost of making design changes varies depending upon the phase of the project in which these changes are made?

b) Explain the type of information used by the Facilities Planner and available from product design, process design, and schedule design.

c) List the two types of input data used, and two types of layout outputs available in computer-aided layout programs.

d) Mention two differences and two similarities between the Assembly Chart and the Operation Process Chart.

e) Describe the unit load principle of material handling to clearly bring out its meaning.

f) Briefly discuss the modular concept of facilities design.

g) You have been asked to layout a facility to manufacture a newly developed product. Briefly explain Muther's key--PQRST –for unlocking layout problems.

h) Distinguish between product layout and fixed material location layout.

---

2. Answer questions (a) and (b) in some amount of detail. Each one of these two questions is the equivalent of one unit worth 10 points:

(a) Are personnel services as important in office facilities as they are in production facilities? Discuss your answer with reference to three of the personnel facilities explained in your book.

(b) Discuss the three categories of material handling equipment used to move material so as to bring out their differences in application. Briefly describe one specific equipment in each category.

---

3. Solve the following two problems (a) and (b). Each question is the equivalent of two units worth 20 points:

(a) Using the information given below, calculate the machine fractions needed for machines A and B to produce parts X and Y?

	Machine A	**Machine B**
Part X standard time	0.1 hr	0.01 hr
Part Y standard time	0.06 hr	0.06 hr
Part X scrap estimate	6%	3%
Part Y scrap estimate	4%	2%
Historical efficiency	95%	90%
Reliability factor	97%	94%
Equipment availability	2,000 hrs./yr.	2,000 hrs/yr.

Part X routing is machine A, then B; 200,000 parts are to be produced per year. Part Y routing is machine B, then A; 100,000 parts are to be produced per year.

(b) The Multiple Products Company manufactures multiple products. Six departments (A, B, C, D, E, and F) are involved in the processing required for the products. A summary of the processing sequences required for the four major products and the monthly production volume for the products is given below. The manufacturing facility is 100 ft by 80 ft. and a layout of the departments is given below. Moves between departments are made on the basis of production lots of 100 units per load.

(i) Develop the from-to-chart giving the number of loads per month moving between combinations of departments.

(ii) Assuming rectilinear travel between departmental centroids, compute the total distance traveled per month based on the given layout..

Product	Processing sequence	Monthly Production
1	A B C D E F	800
2	A B C B E D F	1,000
3	A B E F	600
4	A C E F	1,500