

**OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY**

Semester II Examinations 2002 - 2003

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2BI1: Second Year Industrial Engineering & Information Systems

2BJ1: Second Year Management Engineering with Language

**2BI2: Second Year Industrial Engineering & Information Systems
(Design Stream)**

2BM1: Second Year Mechanical Engineering

IE220: Production Systems 1

Examiners:

Dr. E. J. Wright

Prof. Sheil

Dr. Kathryn Cormican

Answer **four** questions.

Time allowed: **Three** hours

All questions carry equal marks

Use Diagrams to illustrate your answers

Use examples to reinforce your point

No. Pages: Cover + 3

Department: Industrial Eng

Question 1.

(a) Explain clearly what a Master Production Schedule (MPS) record is and where it is used. (10 marks)

(b) Complete the following MRP matrix. (15 marks)

Lot Size = MIN 50 Lead Time = 2	PD	1	2	3	4	5
Gross Requirements			30	50	50	60
Scheduled Receipts			50			
Projected on Hand	40					
Net Requirements						
Planned Order Receipts						
Planned Order Release						

Question 2.

(a) Define Just in Time (JIT) (5 marks)

(b) Identify and discuss the basic elements of JIT (10 marks)

(c) Outline the benefits of JIT (5 marks)

(d) Differentiate between a push and a pull production system (5 marks)

Question 3.

Answer each of the following questions providing examples where appropriate: (5 marks each)

(a) Why is capacity planning strategically important?

(b) Describe three strategies for expanding capacity.

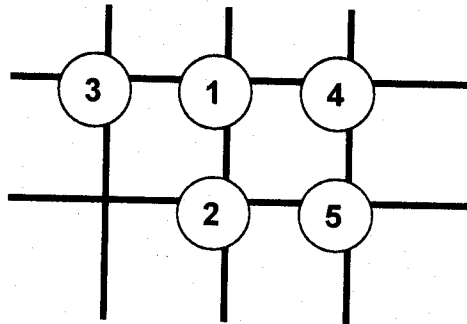
(c) Describe the output of aggregate production planning

(d) How is the aggregate planning process different when used for services rather than for manufacturing?

(e) Consider capacity planning in NUI Galway. What factors influence the acquisition and allocation of resources?

Question 4.

- (a) Distinguish between product and process layout. (5 marks)
- (b) What is the difference between block diagramming and relationship diagramming? (5 marks)
- (c) Cleanex Drycleaners are revising their current layout. The organisation performs five main services. These are (1) laundry, (2) dry cleaning, (3) ironing, (4) alterations and (5) delivery. Each is located in a separate department as shown below. The load summary chart gives the current level of interaction between the departments. Calculate the number of non adjacent loads for the current layout. Design an alternative layout to minimise the number of non adjacent loads. (15 marks)



	1	2	3	4	5
1	-	0	125	40	0
2	0	-	45	75	0
3	0	0	-	20	235
4	60	30	20	-	85
5	0	0	0	0	-

Question 5.

Answer five of the following questions. (5 marks each)

- (a) Define Lean Production

- (b) Outline the four principles of Lean Production
- (c) Differentiate between Lean production and Mass production.
- (d) Define Agile Manufacturing.
- (e) Outline the principles of Agile Manufacturing.
- (f) Differentiate between Agile Manufacturing and Mass Production.

Question 6.

- (a) What is an Environmental Management System (EMS)? (5 marks)
- (b) Discuss the benefits of implementing an EMS (10 marks)
- (c) Describe the key steps involved in implementing ISO14001 (10 marks)