

NATIONAL UNIVERSITY OF IRELAND, GALWAY

SUMMER EXAMINATION 1999

Master of Engineering Science Degree

INTEGRATED MANUFACTURING SYSTEMS

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Time allowed : 3 hours

Answer 5 Questions

1. (a) Using the Customer Order Decoupling Point (CODP), approach, differentiate clearly between the various categories of manufacturing systems.
- (b) What do you understand by the term "Time Based Competition"? How does the ATO (Assemble to Order) approach ensure timely delivery of "customized" products?
2. (a) What do you understand by the term "Extended Enterprise"?
- (b) "In the past, the challenge to manufacture was to achieve integration within the four walls of the manufacturing plant. Today, we seek to network and integrate across the total value chain, including the supply chain and the customer". Discuss.
3. (i) Provide a concise definition and list three associated business benefits for each of the following terms:
 - (a) Enterprise Resource Planning (ERP);
 - (b) Extranet;
 - (c) Electronic Data Interchange (EDI).
- (ii) "Sharing of business information between partners in a supply chain can result in dramatic improvements". Expand upon this statement, outlining in particular, the type of information that can be shared and how this can bring about improvements.
4. Complete the following MPS planning record

Item: Product A		Part number: FP-5026				
Month Number	1	2	3	4	5	6
Manual Forecast	60	100	120	110	120	120
System Forecast	100	100	100	100	100	100
Customer Orders	55	80	80	40	10	20
Total Demand						
MPS						
PAB						

Assume that the product should have a safety stock of 30 and that the lead-time is one month. Further, assume that the projected available balance is initially 40.

The Company has the capacity to manufacture up to 100 products per month and boasts of its ability to fill orders on time. The planner uses the following rules to calculate total demand. In the first two months, he assumes that actual orders constitute total demand. In the later months, he bases his assessment on the manual or system forecast, whichever is the greater. You may assume that you are planning in month 0.

- (b) Comment on the use of RCCP (Rough Cut Capacity Planning) to support the MPS process?
5. (a) Outline the likely impact of the WEEE (Waste from Electrical and Electronic Equipment) directive on electronic product manufacturers?
- (b) Discuss the infrastructural deficits that will have to be addressed if the WEEE directive is to be effectively implemented.
- (c) Outline the issues involved in deciding between the various EOL (End of Life) options for electronic products.
6. Attempt 5 of the following 6 sections
- (i) Distinguish clearly between dependent and independent demand, as encountered in MRP systems?
- (ii) Differentiate clearly between Net Change and Regenerative MPR systems?
- (iii) How are pegging and firm planned orders used to support bottom-up replanning in MRP systems?
- (iv) Distinguish clearly between bucketed and bucketless MRP system?
- (v) How does CRP differ from RCCP? Why is CRP less widely used today?
- (vi) Distinguish clearly between mixed-model and multi-model production?
7. (a) Distinguish clearly between models of the design process and models of designs.
- (b) Write down the implicit, explicit and parametric expressions for a line.
- (c) Explain clearly the differences between the Hermite and the Bezier representations of non-planar curves. Which has proved more popular for interactive design? Why?

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