

OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY

SEMESTER II EXAMINATIONS 1998-1999

BE INDUSTRIAL ENGINEERING AND INFORMATION SYSTEMS

HUMAN AND ORGANISATIONAL ASPECTS OF OPERATIONS IE 430

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Instructions:

Time Allowed: 2 Hours

Attempt: 3 Questions

Show all your work clearly

Question 1.

Marks

Write short notes on **four** of the following:

8.33*x4

- (a) The Hackman and Oldham Job Characteristics Model
- (b) Principles of Sociotechnical Systems
- (c) Levels of control in Supervisory Control
- (d) Criticisms of Lean Production from a Human Factors perspective
- (e) Advantages of Participatory Ergonomics
- (f) Needs for shopfloor information systems

Question 2.

Marks

Outline recent developments in the organisation of manufacturing in Sweden since the 1970's. Explore the differences between Sweden and Ireland with respect to these differences.

33.33*

Question 3.

Marks

Compare and contrast the skill-based and technology-based approaches to the design of Advanced Manufacturing Technology (AMT) systems. What are the implications of each for safety?

33.33*

Question 4.

Marks

- (a) What are the main approaches to job design? Briefly distinguish between each.
- (b) Discuss the influence of one of these on a range of efficiency and human resource outcomes in a manufacturing / assembly context. Use examples from your own experience to illustrate your answer.

15

18.33*

Question 5.

Marks

- (a) What is Supervisory Control? Where appropriate use diagrams to illustrate your answer.
- (b) What are the roles of the supervisor in "Supervisory Control"? Discuss the main issues with respect to one of these roles in the context of Automated Manufacturing Technology.

10

23.33

Question 6.

Marks

- (a) Outline the main assumptions of HITOP analysis
- (b) Categorise and describe the main functions critical to the operation of an Advanced Manufacturing Technology (AMT) system.
- (c) What are the essential task requirements for supervisory and managerial functions in the operation of an AMT system?
- (d) What are the implications for the supervisory and managerial functions of an AMT system given the critical technical features and their respective anchors contained in Figure 1?

6

6

6

15.33*

Critical Technical Features	People Motivation and Management	Proactive Opportunity-seeking	Strategic Goal Setting
Information Integration <u>HIGH</u>			
Mechanical Integration <u>HIGH</u>			
Reliability <u>UNKNOWN</u>			
Flexibility: Programming Set-up Capability <u>LOW</u>			
Flexibility: Difficulty <u>HIGH</u>			
Feedback - Automated Monitoring & Diagnosis <u>HIGH</u>			
Feedback: Automated Correction <u>MEDIUM</u>			
Fault Tolerance <u>LOW</u>			

FIGURE 1: Worksheet for Supervisory and Managerial Functions