

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

---

**AUTUMN EXAMINATIONS 1999**

---

**B. E. DEGREE EXAMINATION IN CIVIL ENGINEERING**  
**B. E. DEGREE EXAMINATION IN ELECTRONIC ENGINEERING**  
**B. E. DEGREE EXAMINATION IN MECHANICAL ENGINEERING**  
**THIRD YEAR INDUSTRIAL ENGINEERING EXAMINATION**  
**DIPLOMA IN QUALITY ASSURANCE EXAMINATION**  
**FIRST SCIENCE (BIOTECHNOLOGY) EXAMINATION**

**INDUSTRIAL MANAGEMENT - IE 307**

**Professor R. W. Scapens**  
**Professor P. Willman**  
**Professor J. F. Collins**  
**Mr. M. Moroney**  
**Ms. E. Curtis**  
**Ms. M. O'Connell**  
**Ms. D. Morgan**

**Time allowed: 3 HOURS**

---

Please answer ONE question from Section A; TWO questions from Section B; and ONE question from Section C. All questions carry equal marks.

**PLEASE USE A SEPARATE ANSWER BOOK FOR EACH SECTION**

**SECTION A – INDUSTRIAL RELATIONS**  
**(Answer ONE question from this Section)**

**Question 1:**

What is a Trade Union? Outline the objectives of a typical Trade Union and identify some key challenges facing the Trade Union movement in Ireland today.

**25 MARKS**

**Question 2:**

Outline the main provisions of the Safety Health and Welfare at Work Act, 1989.

**25 MARKS**

**Question 3:**

Give an account of the Labour Court including its functions and mode of operation.

**25 MARKS**

**[The next Section begins on the following page]**

---

**SECTION B – ACCOUNTING**  
(Answer **TWO** questions from this Section)

**Question 4:**

The Motor Shop has been in business for several years. The following trial balance was extracted from the accounts at 31 July 1999:

	£	£
Accumulated depreciation (at 1 August 1998):		
- on fixtures and fittings		46,000
- on premises		12,000
Bad debts	4,700	
Bank		700
Discounts	500	400
Fixtures and fittings (at cost)	186,000	
Investments	12,300	
Long-term loan		50,000
Premises (at cost)	240,000	
Profit and loss account (balance at 1 August 1998)		6,400
Provision for bad and doubtful debts		950
Purchases	420,000	
Purchases returns		25,000
Rates and insurance	19,000	
Salaries	84,200	
Sales		600,000
Sales returns	50,000	
Share capital		320,000
Share premium		35,000
Stock (at 1 August 1998)	14,000	
Trade debtors and creditors	92,000	26,250
	<u>£1,122,700</u>	<u>£1,122,700</u>

The following information is also provided:

1. Stock at 31 July 1999 was £23,000.
2. The provision for bad and doubtful debts is to be adjusted to 1% of trade debtors.
3. Depreciation for the year ended 31 July 1999 should be provided at the following rates:
  - premises: 1% (straight line basis);
  - fixtures and fittings: 20% (diminishing balance basis).
4. The “investments” included in the trial balance are short-term government bonds, which the company expects to exchange for cash in February 2000.
5. Rates of £1,000 have been prepaid for the period August to December 1999.
6. The following amounts were due but not paid at 31 July 1999:
  - salaries: £300;
  - insurance: £200;
  - 6% interest on the long-term loan.

*[Question 4 continues on the next page]*

**Required:**

- (a) Prepare the Profit & Loss Account of "The Motor Shop" for the year ended 31 July 1999, and a Balance Sheet at that date. (19 marks)
- (b) "It is possible for a firm to report a profit during a financial year but nevertheless have less cash at the end of the year than it had at the beginning of the year".

Explain this statement.

(6 marks)

**TOTAL: 25 MARKS**

**Question 5:**

Boxcar PLC manufactures a patented packaging material called "SecurePax". The company's main customers are couriers and security firms, who use SecurePax in transporting delicate and valuable commodities. The following is a summary of Boxcar PLC's financial results for June 1999:

Sales of "SecurePax": (800 batches @ £2,400 each)		£1,920,000
<b>Production costs:</b>		
Raw materials (22,000 kg. @ £38 per kg.)	£836,000	
Skilled labour (4,000 hours @ £15 per hour)	£60,000	
Unskilled labour (12,000 hours @ £6 per hour)	£72,000	
Sales commission (10% of sales)	£192,000	
Administration costs	£500,000	
		£1,660,000
Profit		<u><u>£260,000</u></u>

Unskilled labour is provided by part-time and short-term employees; the company hires only as much as unskilled labour as it needs each month. The skilled labour force is made up of permanent employees, who would not be made redundant even if there were a temporary decline in demand for SecurePax. Administration costs are also fixed.

[Question 5 continues on the next page]

[Question 5 continued from the previous page]

**Required:**

- (a) Using the data provided for June 1999, calculate the number of batches of SecurePax which must be sold in order to break even in any month.

Also, draw a diagram showing the relationship between the number of batches sold and the profit/loss per month. Graph paper is not required, but in your diagram you should indicate clearly (i) the breakeven point, (ii) the profit or loss when output is zero, and (iii) the actual profit for June 1999.

(8 marks)

- (b) The company has set itself a target of increasing its monthly profit to £300,000. It is considering the following suggestions as to how this can be achieved:

1. Increasing the quantity of SecurePax sold each month, while keeping the price per batch at £2,400.
2. Increasing the selling price per batch, while keeping the quantity sold at 800 batches per month.
3. Decreasing the number of kilograms of raw material per batch of output.

Taking each suggestion separately, calculate the percentage increase or decrease necessary in order to achieve the target.

(11 marks)

- (c) As an alternative to the suggestions in part (b), the sales manager has suggested that profitability could be improved by a package of measures designed to motivate the field sales staff to sell more batches of SecurePax. This proposal involves reducing the selling price by 1% and increasing the rate of sales commission from 10% to 15% of selling price.

If this arrangement had been in place in June 1999, how many units would the company have needed to sell in order to earn its actual profit of £260,000?

(6 marks)

**TOTAL: 25 MARKS**

**P. T. O.**

### Question 6:

**Antibody Manufactures Ltd.**, a small business, maintains its own accounting records on a daily basis using a popular accounting software package. The following is part of the company's trial balance at 31 May 1999:

	£	£
Trade debtor (Galway Chemicals Ltd.)	4,000	
Trade debtor (Sligo Group Ltd.)	13,000	
Trade creditor (Mayo Supplies Ltd.)		9,000
Trade creditor (Roscommon Traders Ltd.)		2,000
Cash at bank	11,000	
Delivery vehicle – at cost	7,000	
Delivery vehicle – accumulated depreciation		5,000

All cash is banked on the day of receipt, and all payments are made by cheque. The following is a summary of the transactions and events which the company recorded in its accounts in the following month (June 1999):

#### **Sales**

- 10 June: Sold goods for cash, £7,500.  
22 June: Sold goods on credit to Galway Chemicals Ltd., £12,800.

#### **Receipts from credit customers**

- 4 June: Received £3,200 of the amount due from Sligo Group Ltd., and wrote off the remainder as a bad debt.  
23 June: Received £6,500 from Galway Chemicals Ltd, and granted £100 discount.

#### **Purchases**

- 8 June: Purchased goods on credit from Mayo Supplies Ltd., £6,000.  
19 June: Purchased goods on credit from Roscommon Traders Ltd., £900.

#### **Payments to suppliers**

- 4 June: Paid in full the amount owed to Mayo Supplies Ltd., less 1% discount.

#### **Delivery vehicle**

On 1 June, the delivery vehicle was sold for £1,800 cash. A new vehicle was immediately purchased (and paid for) at a price of £12,000.

#### **Depreciation**

On 30 June, depreciation of £300 on the new motor vehicle was recorded in the accounts.

#### **Required:**

- (a) Show detailed ledger accounts to record these transactions, including opening and closing balances on each account (where applicable).  
NB: In each ledger account, transaction dates must be shown, and transactions must be shown in proper date order.

(20 marks)

- (b) What is the purpose of recording depreciation in company accounts?

(5 marks)

**TOTAL: 25 MARKS**

### Question 7:

Spiddal Manufacturing are an expanding medium sized manufacturing business. They manufacture low cost fashionable T shirts. These products are sold on both domestic and overseas markets. The company is presently anxious to determine their cash position for the first quarter of the year 2000. The management accountant has assembled the following financial details:

a) Sales achieved in 1999 were as follows:

January	£165,000	April	£405,000
February	£285,000	May	£405,000
March	£390,000		

- b) Sales volume in 2000 is expected to be 20% higher, and to follow the same monthly pattern. The sales price will remain the same at £15 per unit. Proceeds are collected, on average, 20% in the month of sale, and 80% in the following month.
- c) Debtors at 31 December, 1999 are expected to be £160,000.
- d) The company's policy is to hold stocks of finished goods at the end of each month equal to 50% of estimated sales for the following month. Stocks of finished goods are expected to be 6,000 units at 1 January 2000.
- e) Creditors at 1 January 2000 are expected to be £25,000.
- f) Each unit manufactured requires one yard of raw material. This is expected to cost £2.50 per yard. Raw material is held in quantities equal to amounts required for production in the following month, but stocks are expected to be only 10,000 yards at 1 January 2000. One month's credit is normally allowed in respect of purchases
- g) Labour requirements are 0.5 hours per unit of production. Each labour hour costs £4.00 and is paid for in the month of production.
- h) Variable production overheads of £1 per unit of production will be incurred. Fixed overheads are expected to be £580,000 for the year 2000. Apart from depreciation and other non-cash expenses amounting to £100,000, these are expected to be incurred and paid evenly throughout the year.
- i) Machinery costing £60,000 will be delivered in May 2000 but Spiddal Manufacturing will have to pay £20,000 in February 2000 and the balance as cash-on-delivery.
- j) The bank overdraft is expected to be £65,000 on 1 January 2000.

### Required:

- a) Prepare a production budget and a cash budget for Spiddal Manufacturing Ltd. for each of the three months January to March 2000. (20 marks)
- b) Outline the benefits of an annual budgeting process. (5 marks)

**TOTAL: 25 MARKS**

*P. T. O.*

**Question 8:**

Angel Manufacturing Ltd. currently use a factory wide overhead rate calculated on the basis of machine hours to apply manufacturing overheads to jobs produced during the year. This has been the practice of the company for many years.

You are given the following information from the budget for the financial year ended 31 December 1998:

	<u>Assembly Department</u>	<u>Machining Department</u>
Direct labour cost	225,000	75,000
Production overhead	260,000	480,000
	<u>Hours</u>	<u>Hours</u>
Direct labour	45,000	7,500
Machines	15,000	90,000

For the month of December 1998, the cost sheet for Job No. AB61 shows the following information:

	<u>Assembly Department</u>	<u>Machining Department</u>
Materials used	£150	£750
Direct labour	£250	£190
Direct labour hours	50	38
Machine hours	22	128

Following the end of the financial year it was ascertained that actual production overhead incurred by the Assembly Department was £240,000 and that incurred by the Machining Department was £510,000. Actual direct labour hours of the Assembly Department were 43,000 and the Machining department were 8,000. Actual Machine hours in the Assembly and Machining Departments were 14,000 and 92,000 respectively.

**Required**

- Calculate the factory wide production overhead rate currently used by the factory and using this, calculate the production cost of Job AB61. (6 marks)
- Explain the arguments in favour of using departmental overhead application rates and outline some of the criteria which are used in selecting a basis for calculating departmental rates. (6 marks)
- Calculate departmental overhead rates for the Machining Department and the Assembly Department using whatever base you consider is most appropriate. Recalculate the production cost of Job AB61 using these rates. (7 marks)
- Calculate the under/over applied production overheads for the year ended 31 December 1998 using the single factory wide rate and state how that balance should be treated in the accounts. (6 marks)

**TOTAL: 25 MARKS**



**SECTION C – FINANCE**  
(Answer ONE question from this Section)

**Question 9:**

The directors of Zerox Ltd. are keen to obtain £250,000 from their bank manager to help finance the construction of a second warehouse, as part of their expansion operations. They have consulted you as their accountant for your appraisal of the performance and financial position of the company.

Below are the two most recent years' financial statements for Zerox Ltd. In addition, you are told that all purchases and sales are made on credit.

**Profit and Loss Account**  
**For the year ended 31 May**

	1999 £000's	1999 £000's	1998 £000's	1998 £000's
Turnover		2,160		1,800
Cost of sales		<u>1,296</u>		<u>1,044</u>
		864		756
Distribution costs	216		162	
Administration expenses	<u>198</u>		<u>180</u>	
		414		342
Operating profit		450		414
Interest payable		<u>134</u>		<u>134</u>
Profit before taxation		316		280
Taxation		<u>126</u>		<u>112</u>
Profit after taxation		190		168
Dividends		<u>90</u>		<u>76</u>
Retained Profit		<u>100</u>		<u>92</u>

*[Question 9 continues on the next page]*

[Question 9 continued from the previous page]

**Balance Sheet as at 31 May**

	1999 £000's	1999 £000's	1998 £000's	1998 £000's
<b>Fixed Assets</b>				
Land & Buildings		1,800		1,844
Plant & Machinery		<u>1,666</u>		<u>1,510</u>
		3,466		3,354
<b>Current Assets</b>				
Bank	18		138	
Stock	346		246	
Trade Debtors	268		184	
Prepayments	<u>28</u>		<u>28</u>	
	660		596	
<b>Current Liabilities</b>				
Trade Creditors	136		90	
Accruals	24		22	
Taxation	126		112	
Dividends proposed	<u>90</u>		<u>76</u>	
	376		300	
<b>Net current assets</b>		<u>284</u>		<u>296</u>
		3,750		3,650
<b>12% Debentures</b>		<u>1,120</u>		<u>1,120</u>
		<u>2,630</u>		<u>2,530</u>
<b>Ordinary Shares of £1 each</b>		2,000		2,000
<b>Retained profits</b>		<u>630</u>		<u>530</u>
		<u>2,630</u>		<u>2,530</u>

**Required:**

- (a) Prepare a Report for the board of directors giving an appraisal of the likely outcome of the company's application to the bank for finance.  
(Clearly show ratio calculations)

(21 Marks)

- (b) Outline briefly two other methods available to Zerox Ltd. of raising finance.

(4 Marks)

**TOTAL: 25 MARKS**

**Question 10:**

You are required to answer **TWO** of the following:

- (i) Jameson Ltd. has been offered a special job by one of its customers. The job would require the following materials:

Material Type	Total Units Required	Units in stock	Original Purchase price per unit	Replacement cost per unit	Net Realisable Value per unit
R	200	50	2.00	3.50	3.00
S	400	0	-	7.00	-
T	700	300	2.50	5.00	3.50
Q	500	200	3.00	6.00	4.50

Material Type R has no potential use in any other area of the company's operations. Material Type S would be purchased specially for this job. Materials T and Q are used regularly in normal production.

What are the relevant costs of material required for this job?

(12.5 Marks)

- (ii) Cognac Ltd. settles its account with suppliers after 80 days. One of its major suppliers is offering a discount of 5% for payment within 35 days.  
Cognac Ltd. currently borrows from its bank at 20% per annum.

Advise Cognac Ltd. on whether or not it should pay early and qualify for the discount,  
(You may assume a purchase of £1,000)

(12.5 Marks)

- (iii) Define and explain **THREE** of the following terms:

- (a) Overtrading
- (b) Factoring
- (c) Cash conversion cycle
- (d) Opportunity cost

(12.5 Marks)

**TOTAL: 25 MARKS**