

*Ollscoil na hÉireann, Gaillimh*

National University of Ireland, Galway

Autumn Examinations 2002

Bachelor of Commerce Degree Examination

Management Accounting II (AY 321)

Professor N. Garrod

Professor S. Collins

Mr. J. Currie

Dr. B. Sweeney

Time Allowed: Two Hours.

Answer one part of Question 1, and two additional questions.

A Present Value table, and a table of the t-distribution are attached.

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**Question 1:**

This question is compulsory: Answer **EITHER** Part A **OR** Part B for 20 Marks

**Part A:**

You are the accountant in a software development company in Galway which has recently been taken over by a multinational company. A new financial controller (John Weston) has recently been appointed by head office. Weston has said to you that he believes the only way to ensure that there is 'good control' in the company is to set difficult targets for employees to achieve and to link their bonuses to meeting those targets. He has asked you for your opinion on this system of control.

**Required**

Discuss the theories presented in the management control literature on the optimal level of budget difficulty for performance evaluation. (20 Marks)

**Part B:**

**Garrison Ltd.** established a new factory on 1<sup>st</sup> January 2002. This new factory manufactures a single product, and is treated as a profit centre for performance evaluation purposes. The following is a summary of the goods produced and sold in the first four months of operations:

	January	February	March	April
Production (units)	6,000	4,400	5,000	4,600
Sales (units)	5,000	5,100	4,800	4,900

Production costs are €20 per unit (variable) and €75,000 per month (fixed). The product sells for €48 per unit. It is estimated that, over the year as a whole, the average level of production and sales will be 5,000 units per month.

The following statement of monthly profits has been prepared, on a *variable costing* basis:

	January	February	March	April
Profit	€65,000	€67,800	€59,400	€62,200
Increase (decrease) on previous month	Not applicable	€2,800	(€8,400)	€2,800

**Required:**

- (i) Re-draft the statement of monthly profits, on an *absorption costing* basis. (10 Marks)
  - (ii) Explain why absorption costing systems tend to discourage profit centre managers from adopting a just-in-time (JIT) approach to manufacturing. Use the example of Garrison Ltd. to illustrate your answer. (6 Marks)
  - (iii) Briefly explain why *backflush costing* is particularly appropriate for use in JIT production environments. (4 Marks)
- (Total: 20 Marks)

(Total for **ONE PART:** 20 Marks)

**Question 2:**

**Blacklion Ltd.** is a manufacturing company. The company’s factory consists of four cost centres (*viz.*, two service departments and two production departments). Computerised stores records and employee time cards are used to trace labour and materials costs directly to each cost centre. In addition, each department has significant overhead costs. The following table shows the budgeted costs of the four departments for September 2002:

	← Service Departments →		← Production Departments →	
	Information Technology (IT)	Resource Planning (RP)	Fabrication	Completion
Labour	€125,000	€30,000	€160,000	€192,000
Materials	€100,000	€60,000	€615,000	€228,000
General Overhead	€375,000	€120,000	€75,000	€55,000
<b>Totals</b>	<b>€600,000</b>	<b>€210,000</b>	<b>€850,000</b>	<b>€475,000</b>

The costs of the two service departments are regarded as fixed in the short run. However, according to the company’s cost accountant, in the long run the consumption of the “IT” service is proportional to the number of computers in each department while the consumption of the “RP” service is proportional to the number of employees in each department. The numbers of computers and employees in each department are as follows:

	IT	RP	Fabrication	Completion	Totals
Number of computers	8	2	7	3	20
Number of employees	10	15	13	12	50

In the company’s existing cost accounting system, budgeted service departments’ costs are allocated to production departments using a simplified “order of closing” basis of allocation, with the “IT” department’s costs being allocated first.

In each production department, budgeted overhead costs are allocated to products on a labour hour basis. The budgeted numbers of labour hours for September are 5,000 (Fabrication Department) and 6,000 (Completion Department).

**Required:**

- (a) Allocate the service departments’ costs to the production departments, using the company’s existing accounting procedures. Then, calculate the budgeted overhead cost per labour hour in each production department. (8 Marks)
- (b) Show how your answer to part (a) would differ if the service departments’ costs were allocated in accordance with the “reciprocal services” (simultaneous equations) method. (20 Marks)
- (c) The cost accountant has stated: “I can see that changing from our existing allocation method to the reciprocal services method would be more accurate in theory, but I don’t see that it would bring any practical benefits”. Respond to this argument. (7 Marks)
- (d) Explain why allocations of the type arising in Blacklion Ltd. are usually based on budgeted rather than actual costs. (5 Marks)

(Total: 40 Marks)

**Question 3 begins on the next page: P.T.O. ⇒**

**Question 3:**

(a) Explain the concept of ‘Goal Congruence’ (or ‘Action Congruence’) as a characteristic of performance measurement systems, and explain why it is a key feature of an effective management control system.

(12 Marks)

(b) **Zetland Industries Plc.** is an industrial holding company, with five operating business units organised as investment centres, and with responsibility for operating and investment decisions delegated to business unit managers. Central management evaluates the performance of each business unit manager on the basis of the reported Residual Income (RI or EVA) of his or her business unit, and a bonus is paid to the manager as a function of the excess of earned Residual Income over and above a set budget target. Residual Income is calculated using the net book value of invested assets at the beginning of each year, and using a cost of capital of 12%.

Mike is the manager of the Cashel Business Unit of Zetland. His contract expires in two years time, after which he plans to set up his own business. Based on present expectations, Mike is confident that he will earn significant cash bonuses in each of his two remaining years with the company.

Mike has identified a new investment project which requires an immediate fixed asset investment of €200,000. The expected operating cash inflows of the project are as follows:

Year One	Year Two	Year Three	Year Four
€60,000	€65,000	€85,000	€85,000

The fixed asset investment will be depreciated at a rate of 25% of original cost each year over the four-year life of the project. Assume a cost of capital of 12%, and ignore taxation.

**Required:**

- (i) Assuming that Mike is motivated to act completely in the interests of shareholders, should he go ahead with the investment in this project? Show all relevant calculations. (8 Marks)
- (ii) Calculate the expected Residual Income to be contributed by the project to the Cashel business unit’s financial performance in each year of its life, and discuss whether or not Residual Income is likely to be goal congruent in this situation. (12 Marks)

(iii) Although Residual Income is consistent with the Net Present Value criterion in the long run, this is not necessarily so in the short run. Explain the meaning of this statement, and relate it to the possibility that Residual Income may not be goal congruent in the case of some investment decisions. (8 Marks)

(Total: 40 Marks)

#### Question 4:

**Multifarnham Engineering Ltd.** manufactures a range of custom-built gates and railings, using a range of specialised machinery and a skilled workforce.

Each production job requires a 'set-up', i.e. the resetting of the production machinery to match the requirements of the customer's order. These set-ups are regarded as a significant overhead cost driver in the manufacturing process. However, Martha, the management accountant, is unclear as to whether machine hours or direct labour hours would be better used as an additional cost driver (i.e. in addition to set-ups) in forecasting overhead costs for budgeting purposes, and for estimating variable overhead cost rates for costing and pricing purposes.

Cost and activity data are available for the past thirty months, which Martha uses to estimate the following linear cost models, using the 'regression' function in an excel spreadsheet:

Model 1:                      Dependent Variable: Overhead Cost  
Independent (explanatory) variables: Machine Hours; Number of Set-ups.

Model 2:                      Dependent Variable: Overhead Cost  
Independent (explanatory) variables: Direct Labour Hours; Number of Set-ups.

The output from the regression process is given in the next page.

#### Required:

- (a) Martha is considering three possible cost drivers in this situation. Explain how she might have developed the presumption that these are plausible cost drivers before she embarks on model estimation and statistical testing.  
(6 Marks)
- (b) Using the attached regression output, discuss whether Martha should use Machine Hours or Direct Labour Hours as a cost driver (in addition to the number of set-ups) in forecasting overhead costs, and clearly explain the reasons for your recommendation, including reference to and interpretation of relevant statistics and other measures of goodness-of-fit. (Note: Additional calculations should not be required).  
(16 Marks)
- (c) Using the model you have recommended, forecast the overhead cost for next month during which cost-driver activity levels are expected to be 3,600 machine hours, 11,000 direct labour hours and 70 production set-ups. Estimate the 95% confidence interval for the forecast, using the standard error of the estimate as a proxy for the standard error of the forecast. (Note: a table of the t-distribution is attached).  
(10 Marks)
- (d) Martha has estimated the correlation coefficient between machine hours and direct labour hours as 0.90. Explain the likely difficulties this would present for the viability of a regression model which uses all three cost drivers in forecasting overhead cost.  
(8 Marks)

(Total: 40 Marks)

**(Details of the Estimated Regression Models are on the next page)**

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Question 4 is continued on the next page:      P.T.O. ⇒

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