

UNIVERSITY COLLEGE LONDON

University of London

EXAMINATION FOR INTERNAL STUDENTS

For The Following Qualifications:–

B.Eng. M.Eng.

Biochemical Eng E145: Project Appraisal for Bioprocessing

COURSE CODE : **BENGE145**

UNIT VALUE : **0.50**

DATE : **11-MAY-06**

TIME : **10.00**

TIME ALLOWED : **3 Hours**

*Answer FIVE Questions only. Question 1 is **COMPULSORY**. Only the first five answers given will be marked. All Questions carry equal marks.*

1.

On 1st April 2005 a contractor received a contract valued at £24m which was priced with a contribution of 27½%. The contract completion time was 18 months.

Stage payments are: 10% with order
30% on completion of drawings
50% on completion of construction
10% retention for 12 months

Payment terms: 30 days from the date of invoice.

During the financial year (January to December 2005) the Contractor:

- (i) completed all the drawings by 31 July 2005 and invoiced the Client
- (ii) received invoices for materials to the value of £15m for which payment is due on 31 January 2006
- (iii) hired a tower crane, site cabins and JCB for the contract at an average of £20,000 per month starting at 1st July 2005
- (iv) submitted a claim on 31st December 2005 to the Client for extras valued at £750,000

What are the values of the above items and the remaining contract value and how will they appear in:

- (i) the Balance Sheet [10]
- (ii) the Profit & Loss Account [10]

2.

In 2005, a contracting company made a net profit before tax of £600,000 on a turnover of £23,700,000 with direct costs of £16,900,000. An increase in overhead costs of 10% is anticipated in 2006. Assuming that contribution remains at the same level as 2005, what turnover is required in 2006 to achieve breakeven? [8]

Halfway through 2006 the company's turnover is £10,650,000 with a contribution of 24%. What courses of action could the management team consider to rectify the situation? [12]

PLEASE TURN OVER

3.

- (a) Explain briefly what a contract is. In your answer refer to Standard Terms and Conditions of Contract and why they are used. [4]
- (b) What are the essential requirements for a contract to come into existence? [5]
- (c) Is it acceptable to use imprecise wording in a contract? Explain your answer. [4]
- (d) What is meant by ADR; give examples of ADR and explain why it is preferable to litigation in resolving disputes which may arise during contract execution? [7]

4.

- (a) What is meant by NPV? In your answer explain in words rather than in mathematical formulae how a cash-flow over a period of time can have an NPV. [5]
- (b) One formula for expressing NPV is:

$$NPV = FV \left[\frac{1}{i} - \frac{1}{i(1+i)^n} \right]$$

Explain what the different terms in the formula mean. [5]

- (c) Explain why NPV is a better method for assessing the value of a project than the Payback Period, and illustrate your answer with a simple calculation, using the above formula, for a comparison of two alternative domestic solar panel systems, one (A) with a life of 20 years which costs £3,000 to instal and then saves £140 pa over the 20-year life of the equipment and another (B) which also costs £3,000 to install and which saves £150 pa over a 15-year equipment life. Assume that the interest rate you could have obtained on the money spent on the panel is 4% pa. [10]

5.

- (a) A contractor is preparing a conventional competitive tender bid for a project for which the client has issued a detailed specification. What are the two biggest items in his offer price and how does he arrive at them? [7]
- (b) If the specification is functional, how does he decide on the technology on which he will make his offer? [5]

CONTINUED

(c) If his bid is successful, what are his main objectives when executing the contract? [4]

(d) If, instead, it is a DBFOO (Design, Build, Finance, Own and Operate) project, and the contractor is a major shareholder in the operating company, how would this affect (b) and (c)? [4]

6.

(a) Explain briefly why terms of payment are important in the pricing and executing of engineering contracts. [5]

(b) A company has a contract worth £2,400,000 with costs estimated as follows:

Materials	£ 1,200,000
Engineering	£ 160,000
Sub Contract construction costs	£ 200,000
Site establishment costs	£ 120,000
Project management costs	£ 150,000

Engineering is estimated at 3 months duration and construction is expected to be completed six months later. Assume that engineering and construction costs are linear over the periods and that materials costs are spread linearly over three months.

Stage payments are: 10% with order
20% on completion of engineering
70% on completion of construction
Terms are: net cash monthly account

Prepare an approximate quarterly cash flow forecast for the contract identifying interest payments at 10%pa on monies borrowed and calculate the contribution from the contract. [15]

7.

Your company undertakes large multi-disciplinary process plant projects. The staff includes a site process commissioning team. You want to separate their costs out from the company's general overheads in order identify the costs related to their work on contracts.

(a) What is the name of the accountancy system which you can use to do that? [1]

(b) What are the two essential requirements for setting it up? [4]

(c) Describe some of the detailed information which your Management Accounts will use to achieve your aim. [8]

(d) What information will the system yield? How is it kept up to date? How does it help in controlling contract execution? [7]

PLEASE TURN OVER

8.

- (a) What four factors contribute to what might be considered to be a reasonable level of interest on a bank loan? [5]
- (b) How do banks actually set the interest rates which they charge on loans to companies? [2]
- (c) The High Street Banks have been criticised by the Government Watchdog for deliberately making it hard for small companies to move their account to another Bank. In the context of interest rates, why does the Government think that is wrong? [5]
- (d) The Bank of England holds regular meeting to set the Base Rate. What circumstances might make the Bank want to raise or lower it? [4]
- (e) Why does a change in the Base Rate have an immediate impact on some of those who have bank loans?. [4]

END OF PAPER