



KENYATTA UNIVERSITY
UNIVERSITY EXAMINATIONS 2011/2012
SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE IN COMPUTER ENGINEERING
SCT 306: ENGINEERING ECONOMICS

DATE: WEDNESDAY, 11TH APRIL 2012

TIME: 8.00 A.M. – 10.00 A.M.

INSTRUCTIONS

Answer QUESTION ONE and any other TWO QUESTIONS

QUESTION ONE

- a. Lenovo computers have expressed an interest in investing in Kenya after 2012 general elections. Using the principles of engineering economics, show how they would go about solving the human resource bottleneck existing in the Kenyan labour market. **(6 marks)**
- b. Explain the existing approaches to costing that an engineer may apply in decision making. **(6 marks)**
- c. Kirgit Computers is intending to invest in two different ventures with the following net cash flows.

Investment I			Investment II		
Possible (KES)	NCF	Probability	Possible (KES)	NCF	Probability
3600		20%	2400		20%
4400		60%	3400		60%
4700		20%	4400		20%

Evaluate the risk of the two investments and advise the management on the course of action to take. **(6 marks)**

- d. Differentiate between Modified Accelerated Cost Recovery Systems GDS and ADS and provide a rationale for the use of the two systems in different parts of the world **(6 marks)**
- e. As a manager with an engineering background working for the Integritas Group PLC consider the following data:

Year	Output price (KES)	Quantity	Unit cost (KES)	Fixed cost (KES)
2012	6,500	100	4,000	150,000
2013	7,400	250	4,500	150,000

If the firm's share price at the Stock Market is KES 600, what is the investor's required rate of return? **(6 marks)**

QUESTION TWO

- a. It has been empirically proven that most firms generate excess profits by virtue of exploiting consumers. With the aid of a well labelled diagram, explain the inefficiencies associated with the monopoly market structure. **(6 marks)**
- b. Present as clearly as possible the flow diagram for computing depreciation deductions under the Modified Accelerated Costs Recovery System **(6 marks)**
- c. Replacement of equipment is necessary for the survival of firms in the technology industry. Define this concept and further enumerate the factors that must be considered in replacement studies **(8 marks)**

QUESTION THREE

- a. Expound the following concepts as used extensively in the ICT industry
 - i. Bundling **(2 marks)**
 - ii. Search **(2 marks)**
 - iii. Switching costs and lock in **(2 marks)**
- b. Explain the concept of Value Engineering and give its importance in business associated with technology. **(3 marks)**
- c. Virgin Atlantic Airways Wishes to install a computer system for ticketing and reservation at a cost basis of US \$ 1.293 million with a 10 year useful life. The estimated SV of the system is zero at the end of ten years. Determine the annual depreciation amounts using the declining balance method when (a) $R=2/N$ (200% DB method) and (b) $R=1.5/N$ (150% DB method). Tabulate the annual depreciation amount and book value for each year. **(8 marks)**
- d. Why do countries trade? Explain your answer using the basic theories of international trade and providing a numerical example **(3 marks)**.

QUESTION FOUR

- a. A server purchased by Aljabri Logisticians has a basis of 250,000 and is expected to have a 70,000 salvage value when replaced after 20,000 hours of use. Find its depreciation rate per hour of use, and find its book value after 10000 hours of operation. **(5 marks)**.
- b. Prichet Technologies has estimated the following demand equation for its product:

$$Q_D = 12,000 - 40P$$

where

P = price / unit

Q_D = quantity demanded per year

The firm's total costs are 4,000 shillings when nothing is produced. These costs increase by 50 cents for each unit produced.

- i. Write the equation for the total cost function (4 marks)
- ii. Specify the marginal cost function (3 marks)
- iii. Obtain the optimal quantity when the firm maximizes profits (5 marks)
- iv. What model of market pricing behaviour has been assumed in this problem? (3 marks)

QUESTION FIVE

- a. Explain the difference between cost effectiveness analysis and cost benefit analysis (6 marks)
- b. What are the pros and cons of using the above two methods? (4 marks)
- c. Muthiora engineers intend to conduct an economic analysis for a project they want to start in Garissa County. They have obtained the following data.

Construction outlay	0	-10,000
Construction outlay	1	-6,000
Construction outlay	2	-4,000
Increased Employment	0	+4,560
Increased Employment	1	+2,736
Increased Employment	2	+1,824
Revenues from training	3-20	+500
Revenues from software support	2-20	+1,000
Revenue from sale of software	3-20	+1,500
Income from firm's canteen	3-20	+1,000

- i. Determine the benefit cost ratio for the given project (4 marks).
- ii. Based on the analysis, should the project takeoff? Explain (3 marks).
- iii. What are some of the intangible secondary benefits and costs associated with such projects (3 marks).
