



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE (MANUFACTURING AND MECHANICAL ENGINEERING AND BACHELOR OF SCIENCE (ENERGY ENGINEERING))

SET 401: PROJECT MANAGEMENT

DATE: Monday 28th November, 2011

TIME: 8.00 a.m. – 10.00 a.m.

Instructions

Answer any Three questions
Table of normal areas attached

Question one (20 marks)

- a) For a project that is already underway in Kenyatta university, identify the key areas requiring monitoring and suggest the kind of information and procedures that would be involved. (6 marks)
- b) "Success criteria can be described as being **hard** or **soft**". With engineering examples, distinguish between the two concepts. (6 marks)
- c) Solve the following linear program using the simplex method

$$\text{Minimize } z = 30x_1 + 10x_2$$

$$\text{Subject to } 2x_1 + 4x_2 \leq 80$$

$$x_1 + x_2 \leq 25$$

$$8x_1 + 6x_2 \geq 120$$

$$x_1, x_2 \geq 0$$

(10 marks)

Question Two (20 marks)

- a) Explain what elements that constitute social and gender appraisal of projects. (4 marks)
- b) OLUOCH International is considering four major projects which have either two- or three-year lives. The firm has raised all of its capital in the form of equity and

has never borrowed money. This is partly due to the success of the business in generating income and partly due to an insistence by the dominant managing director that borrowing is to be avoided if at all possible. Shareholders in OLUOCH International regard the firm as relatively risky, given its existing portfolio of projects. Other firms' shares in this risk class have generally given a return of 16 per cent per annum and this is taken as the opportunity cost of capital for the investment projects. The risk level for the proposed projects is the same as that of the existing range of activities. Ignore taxation and inflation.

Points in time (yearly intervals)	Net Cash flows			
	t_0	t_1	t_2	t_3
Project A	-5,266	2,500	2,500	2,500
Project B	-8,000	0	0	10,000
Project C	-2,100	200	2,900	0
Project D	-1,975	1,600	800	0

Required

- The managing director has been on a one-day intensive course to learn about project appraisal techniques. Unfortunately, during the one slot given over to NPV he had to leave the room to deal with a business crisis, and therefore does not understand it. He vaguely understands IRR and insists that you use this to calculate which of the four projects should be proceeded with, if there are no limitations on the number that can be undertaken. (7 marks)
- State which is the best project if they are mutually exclusive (i.e. accepting one excludes the possibility of accepting another), using IRR. (2 marks)
- Use the NPV decision rule to rank the projects and explain why, under conditions of mutual exclusivity, the selected project differs from that under (b). (7 marks)

Question Three (20 marks)

The table below defines the activities within a small project.

Activity	Start Node	End Node	Completion time (Weeks)
1	1	2	2
2	1	3	4
3	2	4	7
4	3	4	3
5	3	5	7
6	4	5	3
7	5	6	4
8	4	6	6
9	6	7	2
10	4	7	7

b) The following table provides cost and time estimates for a seven activity project.

Activity	Time estimates (weeks)		Direct costs	
	Normal	Crash	Normal	Crash
1 – 2	2	1	10	15
1 – 3	8	5	15	21
2 – 4	4	3	20	24
3 – 4	1	1	7	7
3 – 5	2	1	8	15
4 – 6	5	3	10	16
5 – 6	6	2	12	36

You are required to

- Draw the project network corresponding to normal time (2 marks)
- Determine the critical path and the normal duration and the cost of the project (6 marks)
- Crash the activities so that the project completion reduces to 9 weeks (6 marks)