TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN CIVIL ENGINEERING
(BSCE)

ECE 2501: CIVIL ENGINEERING MANAGEMENT I

END OF SEMESTER EXAMINATION
SERIES: AUGUST 2014
TIME ALLOWED: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer booklet*

This paper consists of **FIVE** questions.
Answer question **ONE (COMPULSORY)** and any other **TWO** questions
All questions carry equal marks
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (COMPULSORY)

a) Draw up a plant policy for a construction firm with an annual turnover of ksh 450m. **(8 marks)**

b) Outline general and particular aspects which should be considered in the selection of:
- **(i)** Earth moving plant
- **(ii)** Crane for a high rise building project. **(10 marks)**

c) Outline the records necessary in plant maintenance. **(6 marks)**

d) Discuss with the aid of suitable graphs/curves the various costs involved in plant maintenance with respect to frequency of inspection. **(6 marks)**

Question Two

a) Discuss the merits and the demerits in the use of network analysis diagrams. **(5 marks)**

b) Rearrange and prepare a critical path diagram for a project whose activities are shown below:

ACTIVITY	IMMEDIATELY PRECEDING ACTIVITY	DURATION (WEEKS)
A	-	8
C	A	7
G	C	12
H	C	6
B	A	6
D	C	5
H	C	6
J	E	8
K	J	10
E	B,C	7
F	D	9
L	F, E	8
M	F, E	6
N	G, H	12
O	M	7
P	L	6
Q	N, O, P	6
R	Q, K	5

(15 marks)

Question Three

a) Justify the need for contractors to hold stock. **(5 marks)**

b) Outline the FOUR main categories of inventory costs. **(5 marks)**

c) Discuss the significance of inventory models, and using the deterministic model – EOQ Formula, find the optimum batch size to minimize inventory costs the number of orders placed per year and the length of the inventory circle where the demand of a commodity is 80,000 units per year, at a steady rate and that it costs kshs 500 to place an order, and kshs 90 a unit to hold per year. **(10 marks)**

Question Four

a) Briefly explain the following techniques used in decision theory, to assist management in assessment of the degree of uncertainty involved in decision making:-

(i) Worst possible/best possible

(ii) The minimax and minimax regret criterion
(iii) Probabilities and expected values

b) There are THREE mutually exclusive options, PQR. A conditional profit table has been prepared as follows:

	OUTCOME			
Option	P	400	700	900
	Q	450	1200	1500
	R	250	600	1800
Probability of each Outcome Occurring		0.2	0.5	0.3

What option:
would be selected using:
- The minimax criterion ?
- the minimax regret criterion?
- The expected value criterion?

Question Five

a) Outline the time/cost optimization procedure. **(4 marks)**

b) Draw a network analysis diagram for project X shown below and determine the optimum (duration/cost) cost and duration for the project. **(16 marks)**

Project X

Activity	**Immediately Proceeding Act**	**Normal Duration**	**Cost per Week**	**Duration**	**Cost per Week**
A	-	6	15,000	1	3,000
B	A	5	20,000	1	6,000
C	B	5	25,000	1	7,500
D	B	5	12,000	2	3,500
E	A	8	36,000	2	5,000
F	3	3	12,000	-	
	Total Normal Costs		120,000		

Administration and overhead standing costs kshs 5,000 per week.