



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT BUILDING AND CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**BSC IN CIVIL ENGINEERING**

**ECE 2501: ENGINEERING MANAGEMENT I**

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2016**

**TIME: 2HOURS**

**DATE:9 May 2016**

## **Instructions to Candidates**

You should have the following for this examination

*-Answer Booklet, Drawing Instruments, Scientific calculator, examination pass and student ID*

This paper consists of five questions. Attempt question ONE (Compulsory) and any other TWO questions.

## QUESTION ONE

- a) Draw up a plant policy for a construction firm, with annual turnover of ksh. 600m (6marks)
- b) Discuss factors which site managers should take into account to make efficient plant utilization. (6marks)
- c) Discuss the significance of inventory planning and control. (7 marks)
- d) The demand of a commodity is 10000 units per year, at a steady rate. It costs sh.3500 to place an order, and sh 75 to hold a unit for a year. Find the batch size to minimize inventory costs, the number of orders placed per year, and the length of the inventory cycle. (10 marks)

## QUESTION TWO

Draw an arrow network diagram for, project X, tabulated in the chart given below. Calculate the float of each activity and show the critical path of the diagram. Summarise the data in a network analysis chart. (20 marks)

Activity      duration (weeks) immediately preceding activity   EST   LST float   critical path.

## QUESTION THREE

- a) Discuss the merits and demerits of maintain low or high inventory volumes (6marks)
- b) Explain the following inventory models;
  - i) Deterministic
  - ii) Stochastic (8marks)
- c) Outline all classes of inventory costs (6 marks)

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## QUESTION FOUR

- a) Use hypothetical examples to explain the following methods of depreciating plant.
  - i) Declining balance method,
  - ii) Sum of the digits method. (6marks)
- b) Outline the methods of plant maintenance stating the weaknesses and strengths of each. (6 marks)
- c)
  - i) Use graphical methods to explain the various maintenance costs
  - iii) Outline the mandatory records of plant maintenance work. (8marks)

## QUESTION FIVE

A mechanical shovel with 1m<sup>3</sup> shovel capacity was purchased at sh. 14.5m and has a resale value of sh. 5.5m, after 6 years of use. Determine the owning and running costs of the plant, and the cost of 1m<sup>3</sup> basement excavation, using the machine. (20 marks)