TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY IN CONJUCTION WITH KENYA INSTITUTE OF HIGHWAYS AND BUILIDNG TECHNOLOGY (KIHBT)

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

HIGHER DIPLOMA IN BUILDING ECONOMICS

EBE 3119: MEHCANICAL PLANT AND EQUIPMENT I B

END OF SEMESTER EXAMINATIONS
SERIES: OCTOBER 2016

TIME: 2HOURS

Instruction to candidates

You should have the following for this examination

- Answer booklet
- Pocket Calculator

This paper consist of five question.
Answer any three questions of the five questions
All question carry equal marks
Maximum marks for each part of a question are as shown
This paper consist of two printed pages

QUESTION ONE

a) Define the term **'equipment".** (1 Mark)

b) Explain **SIX** factors affecting the use of mechanical plants. (12 Marks)

c) Outline **FIVE** factors to be considered when choosing an item of plant. (5 Marks)

d) Define the term **"installment".** (1 Mark)

e) Define the term **"plant".** (1 Mark)

QUESTION TWO

a) Explain the following:-

i. Standard Plant

ii. Special Plant (4 Marks)

b) Explain **FIVE** factors to be considered in the maintenance of plants and equipment. (5 Marks)

c) A contractor purchased an item of plant at a cost of Ksh. 560,000/- and its estimated economic life is 7 years. The plant is expected to work for 2500 hours per year. The average depreciation rate per year is 27.5%.

i. Assuming a salvage value of Ksh. 18,000/- at the end of the 7 years, use straight line method to calculate the depreciation per hour.

ii. Using the declining balance method, draw a table showing the value of the plant at the end of each year.

(8 Marks)

d) Outline **THREE** factors to be considered before hiring an item of plant. (7 Marks)

QUESTION THREE

a) An item of plant has a cash price of Ksh. 630,000/-. Determine the cost of purchase by hire purchase if the initial deposit is 38% of the cash price, the interest rate is 7% p.a. The payment period is 26 months. Also determine the monthly payment. (6 Marks)

b) State **FIVE** elements of cycle time of a concrete mixer. (5 Marks)

c) Explain **FOUR** factors that affect the productivity of a bulldozer. (4 Marks)

d) State **FIVE** factors to be considered when selecting the type of concrete mixer required. (5 Marks)

QUESTION FOUR

a) Explain the following methods of calculations:-
   i. Declining balance method
   ii. Sum of the year digit
   iii. Straight line method
   iv. Sinking fund (7 Marks)

b) Explain the following:-
   i. Operating factor
   ii. Serviceability factor
   iii. Utilization factor (5 Marks)

c) A site operated 50 weeks a year, 7 days a week and 8 hours a day. Poor work planning kept the plant idle for 8 weeks. During the remaining time, the excavator could not be used because of a breakdown for 4 hours each week. Determine the following:-
   i. Hours available for work
   ii. Hours the work was found
   iii. Hours actually worked
   iv. Operating factors
   v. Serviceability factor
   vi. Utilization factor

(8 Marks)

QUESTION FIVE

a) Outline **THREE** precautions to be observed when handling lifting appliances (3 Marks)

b) Explain the following terms in relation to trucks:-
   i. Heaped capacity
   ii. Plant balancing
   iii. Payload
   iv. Truck capacity
   v. General trucks (10 Marks)

c) Explain **FIVE** factors affecting the productivity of trucks. (5 Marks)

d) State **TWO** importance of using plants in construction works (2 Marks)