



TECHNICAL UNIVERSITY OF MOMBASA

**FACULTY OF ENGINEERING AND TECHNOLOGY IN CONJUNCTION WITH KENYA
INSTITUTE OF HIGHWAYS AND BUILDING TECHNOLOGY (KIHBT)**

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

HIGHER DIPLOMA IN BUILDING ECONOMICS

EBE 3119: MECHANICAL PLANT AND EQUIPMENT I B

END OF SEMESTER EXAMINATIONS
SERIES: OCTOBER 2016

TIME: 2 HOURS

Instruction to candidates

You should have the following for this examination

- Answer booklet
- Pocket Calculator

This paper consists of five questions.

Answer any three questions of the five questions

All questions carry equal marks

Maximum marks for each part of a question are as shown

This paper consists 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)