



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

KIBIT EXAMINATIONS FOR:

HIGHER DIPLOMA IN BUILDING AND CIVIL ENGINEERING

(BUILDING ECONOMICS OPTION)

EBC 3205: MECHANICAL PLANT AND EQUIPMENT

YEAR 2 SEMESTER I

SERIES: DECEMBER 2017

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Pocket calculator

This paper consists of **FIVE** questions. Attempt any **THREE** questions

Do not write on the question paper.

Mobile Phones are NOT allowed inside the examination room.

QUESTION ONE

(a) State the **FIVE** factors considered when selecting a particular crane. **(10 Marks)**

(b) With the aid of a well labeled sketch briefly explain self-supporting static tower Crane. **(10 Marks)**



QUESTION TWO

(a) With the aid of well labeled sketches briefly explain the operation of the following types of plants:- (i) Hoist

(ii) Elevators (11 Marks)

(b) State **SIX** factors considered when selecting a particular item of excavating plant. (9 Marks)

QUESTION THREE

(a) With the aid of a sketch explain the operation of fly jib (5 Marks)

(b) State the **FIVE** factors affecting the productivity of excavating plant. (5 Marks)

(c) Soil is to be excavated from trench 1.2 km long x 2.0m deep x 1.5m wide using an excavator with a bucket capacity of 0.5 m^3 . Soil swell factor is 1.25. Cave in factor is 10%. Bucket efficiency is 1.2. The plant works for 52 minutes per hour. Excavation cycle time is 1.2 minutes.

Determine:-

(i) Volume of loose material to be transported offsite

(ii) Time to excavate trench

(iii) Frequency at which trucks of capacity 8m^3 be available. (10 Marks)

QUESTION FOUR

(a) With the aid of a well labeled sketch, describe a bulldozer. (10 Marks)

(b) State the steps involved in the production of power by an internal combustion Engine. (10 Marks)

QUESTION FIVE

(a) Explain **FIVE** ways of classifying internal combustion engines. (10 Marks)

(b) With the aid of sketches explain working principle for a **Four** Stroke diesel Engine. (10 Marks)