



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 **TWO** 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 climbing 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)**

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(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 1.5 km long x 2.0m deep x 1.5m wide using an excavator with a bucket capacity of 0.6 m^3 . Soil swell factor is 1.25. Cave in factor is 12 % . Bucket efficiency is 1.2. The plant works for 52 minutes per hour. Excavation cycle time is 1.5 minutes .

Determine:-

(i) Volume of loose material to be transported offsite

(ii) Time to excavate trench

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

(10 marks)

QUESTION FOUR

(a) Explain FIVE ways of classifying internal combustion engines

(10 Marks)

(b) With the aid of sketches explain working of a **two** Stroke diesel Engine

(10 Marks)

QUESTION FIVE

(a) Briefly describe multi-purpose Excavator

(5 Marks)

(b) State the main functions of a bulldozer

(5 Marks)

(c) State the steps involved in the production of power by internal combustion Engine

(10 Marks)