TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology in Conjunction with Kenya Institute of Highways and Building & Technology (KIHBT)

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & ECONOMICS (HDBE)

EBE 3205: MECHANICAL PLANT & EQUIPMENT III

END OF SEMESTER EXAMINATION
SERIES: AUGUST 2013
TIME ALLOWED: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
        - *Answer Booklet*
This paper consists of **FIVE** questions.
 Answer any **THREE** questions
Maximum marks for each part of a question are as shown

This paper consists of **TWO** printed pages

Question One

a) With the aid of a sketch, describe the operation of elevations **(8 marks)**

b) Using sketches, differentiate saddle and luffing jib **(8 marks)**

c) State **TWO** types of static bases **(4 marks)**

Question Two

a) Using a sketch, describe the operation of climbing tower crane **(10 marks)**

b) Briefly describe the operation of the following types of mobile cranes:
  (i)   Mobile wheeled cranes
  (ii) Lorry or truck mounted crane **(10 marks)**

Question Three

a) State **EIGHT** factors considered when selecting a particular type of excavating plant **(8 marks)**

b) Using a sketch, describe the operation of drag line **(12 marks)**

Question Four

a) State the factors affecting:-
  (i)   Productivity of excavations
  (ii) Excavation output **(8 marks)**

b) Soil is to be excavated from trench 1.2km long by 2m deep by 1m wide. An excavation with a bucket of capacity 0.5m3 is used. Soil swell factor is 1.25. Cave is factor is 10% bucket efficiency is 1.2. Machine works for 50 minutes in each hour. Excavation cycle time is 25 seconds.

  Calculate:
  (i)   Volume of loose material to be transported off-site.
  (ii) Time taken to excavate trench
  (iii) Frequency at which trucks of capacity $8m^3$ be available **(12 marks)**

Question Five

a) State the steps involved in the production of power by internal combustion engine. **(5 marks)**

b) Using a sketch, describe the operation of a two stroke engine **(10 marks)**

c) State **FIVE** disadvantages of a two stroke engine **(5 marks)**