



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

DBC, DCC , CA 08

CONSTRUCTION PLANT

FINAL EXAMINATION

APRIL/MAY 2010 SERIES

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination:

Answer booklet

This paper consists of **FIVE** questions.

Answer Question **ONE** is **COMPULSORY**.

Answer **ANY** other **TWO** Questions.

Maximum marks for each Question are as shown.

Question ONE

- (a). A mechanical excavator has a shovel capacity of 0.75m^3 (bucket size) and works at 70% efficiency.
Its excavating a basement size 10 x8 x 6m deep.
The red soil bulks at 25%. Cycle time of the machine is 6min. How long will it take to excavate the basement. (assume a 9hr working day).
(7 Marks)
- (b). Briefly outline **THREE** likely objectives of purchasing new plant.
(3 Marks)
- (c). With the aid of a sketch, describe the operation of a back-actor.
(10 Marks)
- (d). Outline **FOUR** factors a contractor needs to bear in mind while selecting plant.
(4 Marks)
- (e). Briefly discuss **TWO** methods of calculating depreciation in construction plant.
(6 Marks)

Question TWO

- (a). Briefly outline **TEN** safety pre-causations required while using cranes.
(10 Marks)
- (b). Outline **THREE** differences between a highway and a site dumper.
(6 Marks)
- (c). Briefly describe the NON-TILTING type of concrete mixer.
(5 Marks)

Question THREE

- (a). Describe **FIVE** regulations to be considered during the operation of a passenger or material hoist.
(5 Marks)
- (b). With the aid of a sketch, describe the self-propelled mobile crane.
(10 Marks)
- (c). Outline **FIVE** advantages of a wheeled dozer.
(5 Marks)

Question FOUR

- (a). Calculate the cost of owning and operating a bull dozer given the following data:

Purchase price - 20millions
Resale value - 6 million
Useful life of plant - 5 years
Repairs and maintenance - 10% of depreciation
Taxes and insurance - 5% of depreciation
Diesel – consumers 12 litres per 9 hour day at 40/= per litre.
Operator wages – 12000 per week
Lubricating oil – 5litres/week @ 120/- per liter
Overheads and profits – 20%

(10 Marks)

- (b). Briefly explain the operation of the following concrete mixers:

- (i). Reversing
(ii). Pan type

(6 Marks)

- (c). Outline **FOUR** aims of mechanizing site operation.

(4 Marks)

Question FIVE

- (a). With the aid of a sketch describe the operation of a trencher.

(10 Marks)

- (b). Outline **FIVE** factors that influence mechanical handling of construction plant.

(5 Marks)

- (c). Outline **FIVE** items of field service in construction plant.

(5 Marks)