



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

Faculty of Engineering & Technology

DEPARTMENT OF CIVIL AND BUILDING ENGINEERING

DBC, DCC , CA 08

CONSTRUCTION PLANT

SEMESTER EXAMINATIONS

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). Briefly describe **FIVE** reasons of mechanizing. **(5 Marks)**
- (b). Outline **FIVE** factors that affect plant output. **(5 Marks)**
- (c). Calculate the cost of owning and operating a face shovel given the following Data;

| | | | |
|---------------------------------|---|--|-------------------|
| Purchase price | - | 12.5m | |
| Resale value | - | 4.5m | |
| Useful life | - | 6 years | |
| Average repairs and maintenance | - | 780,000 | |
| Taxes and insurance | - | 5% of depreciation | |
| Diesel – consumers | - | 7litres per 9 hour day @38/- per 1 litre | |
| Operators wages | - | 5000 per week | |
| Lubricating oil | - | 3 litres per week @120/= /litre | |
| 2No. Banks man | - | @ 300/= per day | |
| Tyres | - | 3 sets @ 560,000 | |
| Overheads and profits | - | 20% | (10 Marks) |

- (d). Define the terms “labour intensive” and “Capital Intensive” systems in relation to construction industry giving two advantages of each. **(6 Marks)**
- (e). Briefly describe “depreciation”. **(4 Marks)**

Question TWO

- (a). With the aid of a sketch, describe the operation of a face shovel. **(10 Marks)**
- (b). Outline **FIVE** reasons for maintaining plant. **(5 Marks)**
- (c). Outline **FIVE** reasons for breakdown in machines. **(5 Marks)**

Question THREE

- (a). A contractor may acquire plant by purchasing his own, hire it or rent it with option to purchase. Give **THREE** advantages and **TWO** disadvantages of hiring over purchase. **(6 Marks)**
- (b). How long will it take a back actor with a shovel capacity of 0.35m³ to excavate an embankment with 154m³ of soil to be excavated if the cycle time of the machine is 5min and the machine works at 80% efficiency (give answer in days.) **(6 Marks)**

- (c). With the aid of a sketch describe the construction of a site chamber.
(8 Marks)

Question FOUR

- (a). Briefly describe **FIVE** factors affecting selecting of a crane.
(5 Marks)
- (b). With the aid of a sketch, describe the operation of a climbing crane.
(15 Marks)

Question FIVE

- (a). With the aid of a sketch, describe the operation of a multi-purpose excavator.
(10 Marks)
- (b). Outline **FIVE** regulations that govern the operation of lifting equipment.
(5 Marks)
- (c). Briefly discuss the straight line and sum of digit methods of calculating depreciation in construction plant.
(5 Marks)