



THE MOMBASA POLYTECHNIC UNIVERSITY COLLEGE

(A Constituent College of Jkuat)

Faculty of Engineering and Technology

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING (HDBC II)

EBC 3115: CONSTRUCTION PLANT AND EQUIPMENT

END OF SEMESTER EXAMINATION

SERIES: AUGUST/SEPTEMBER 2011

TIME: 3 HOURS

Instructions to Candidates:

You should have the following for this examination

- *Answer booklet*
- *Pocket Calculator*

This paper consists of **FIVE** questions

Answer **THREE** questions

Maximum marks for each or part of a Question are as shown

This paper consists of **THREE** printed pages

Question 1

- a) State with brief explanations **FOUR** reasons for use of Construction plant in Building and Civil Engineering operations (15 ½ marks)
- b) Name **THREE** types of plant used in each of the following operations and the best condition for which it is suited where necessary (17½ marks)
- (i) Excavations
 - (ii) Transporting and Lifting
 - (iii) Compacting

Question 2

- a) Build up the hourly rate of owning a Bulldozer using the following information (20 marks)
- | | |
|---|----------------------------|
| - Purchase of new Tracked Bulldozer | Kshs 9,500,000 |
| - Economic working life of Bulldozer | 7 years |
| - Salvage value after Economic working life | Kshs. 1,200,000 |
| - Working hours per year | 2000 hours |
| - Haulage cost to and from site per year | Kshs. 480,000 |
| - Licence per annum | kshs 21,000,000 |
| - Interest and Insurance per year | 30% of annual depreciation |
| - General Maintenance and repair per annum | 30% of annual depreciation |
- b) Calculate the output of a 0.75m capacity face shovel excavating basement in ordinary soil with a bulkage of 30% and loading directly onto Lorries, with a time cycle of 8 minutes (7 marks)
- c) Explain the term 'Depreciation' as used in Construction Plant (6 marks)

Question 3

- a) State and briefly explain **FOUR** factors that affect the productivity of:
- (i) Concreting plant
 - (ii) Piling plant
- (12 marks)
- b) Differentiate between a Tracked (Crawler-mounted) and Wheel-mounted Bulldozer with sketches and state the advantages of each. (21 marks)

Question 4

- a) Explain the straight line method of depreciation (10 marks)
- b) Using the straight line method of depreciation calculate the annual depreciation of the Bulldozer in (question 2 (a) above) (12 marks)
- c) State **THREE** factors which may determine the choice to purchase or hire plant for a given project (11 marks)

Question 5

- a) State the difference between owning and operating costs and list FIVE such costs in each case (15 marks)
- b) Explain the difference between 'Maintenance' and 'Repair' and state FOUR reasons for carrying out maintenance of plant. (18 marks)