



TECHNICAL UNIVERSITY OF MOMBASA  
**Faculty of Engineering &  
Technology**

DEPARTMENT OF BUILDING & CIVIL ENGINEERING  
**DIPLOMA IN BUILDING & CIVIL ENGINEERING (DBCE 13J)**

EBC 2306: CONSTRUCTION PLANT & EQUIPMENT

**END OF SEMESTER EXAMINATION**

**SERIES: APRIL 2015**

**TIME ALLOWED: 2 HOURS**

**Instructions to Candidates:**

You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions. Answer any **THREE** questions of the **FIVE** questions

Maximum marks for each part of a question are as shown

Use neat, large and well labeled diagrams where required

This paper consists of **THREE** printed pages

### Question One

- a) A site operated for 50 weeks a year, 6 days a week and 7 hours a day. Poor work planning kept the plant idle for 10 weeks. During the remaining time, the bulldozer could not be used because of a breakdown for 5 hours each week. Determine:
- (i) Hours available for works
  - (ii) Hours work was found
  - (iii) Hours actually worked
  - (iv) Operating factor
  - (v) Utilization factor (state whether it can be bought it can be bought or hired)
  - (vi) Serviceability factor
- (10 marks)**
- b) Explain the following terms as used in trucks:
- (i) Plant matching
  - (ii) Payload
  - (iii) Truck capacity
  - (iv) Plant balancing
  - (v) Heaped capacity
- (10 marks)**

### Question Two

- a) Explain the following terms:
- (i) Serviceability factor
  - (ii) Utilization factor
  - (iii) Operating factor
- (6 marks)**
- b) State FIVE reasons for using Mechanical plant in construction **(5 marks)**
- c) Outline TWO factors which affect the productivity of a plant **(2 marks)**
- d) State TWO advantages and TWO disadvantages of INSTALLMENTS in purchasing of plant **(4 marks)**
- e) State THREE factors that affect the choice of plant **(3 marks)**

### Question Three

- a) State the differences in operations of the following types of cranes:
- (i) Mobile crane
  - (ii) Static crane
  - (iii) Tower crane
- (6 marks)**
- b) Explain the following terms:
- (i) Straight line method
  - (ii) Declining balance
  - (iii) Sum of the year digit method
- (6 marks)**

- c) An item of plant has cash price of 1,000,000/= determine the cost of purchase through hire purchase if initial deposit is 35% of the cash price. The interest rate is 8.5% per annum and the payment period is 48 months. Determine also the monthly payment of the same plant **(8 marks)**

#### **Question Four**

- a) Explain the following types of trucks:  
(i) Articulated trucks  
(ii) Rigid trucks **(6 marks)**
- b) Outline FOUR factors that affect the productivity of trucks **(4 marks)**
- c) State FOUR main functions of a bulldozer **(4 marks)**
- d) State THREE precautions to be adhered to when operating a HOIST **(3 marks)**
- e) Define the term “equipment” **(1 mark)**
- f) State TWO types of dump trucks and explain their features briefly **(2 marks)**

#### **Question Five**

- a) State THREE types of scrapers and explain their features **(6 marks)**
- b) State FOUR types of TOWER CRANES and explain their features **(8 marks)**
- c) Explain the following:  
(i) Bottom dump trucks  
(ii) Tractor scraper **(3 marks)**
- d) Explain the following types of purchasing methods of a plant:  
(i) CASH  
(ii) INSTALLMENT **(3 marks)**