



TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN BUILDING AND CIVIL ENGINEERING

EBC 2306 CONSTRUCTION PLANT AND EQUIPMENT

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2016

TIME: 2 HOURS

DATE: 22 Dec 2016

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

-Drawing instruments.

-Scientific calculator

This paper consists of five questions.

Attempt any THREE questions.

Do not write on the question paper.

Question One

- (a) State FOUR reasons for using construction plant (**4 marks**)
- (b) Define the following terms as used in serviceability and utilization of construction plant
- (i) Servicing and cleaning
 - ii) Preventive maintenance
 - iii) planned maintenance (**6 marks**)
- (c) Soil is to be excavated from trench 1.2 km long x 2.0m deep x 1.5m wide using an excavator with a bucket capacity of 0.5 m^3 . Soil swell factor is 1.25. Cave in factor is 10 %. Bucket efficiency is 1.2. The plant works for 52 minutes per hour. Excavation cycle time is 1.2 minutes.

Determine:-

- i) Volume of loose material to be transported offsite
- ii) Time to excavate trench
- iii) Frequency at which trucks of capacity 8 m^3 be available (**10 marks**)

Question Two

- (a) (i) Briefly explain the accidents involving lifting plant
- (ii) Briefly explain the precautions against accidents in 2 a (i) (**10 marks**)
- (b) With the aid of a sketch, explain high level discharge dumper (5 marks)
- (c) Explain the following terms used in expressing trucks
- (i) pay-load
 - (ii) Truck capacity
 - (iii) Heaped capacity (**5 marks**)

Question Three

- a) State the FOUR factors considered when selecting rollers (**4 marks**)
- b) Explain THREE factors affecting comp active effort of rollers (**6 marks**)
- c) Using sketches, describe:-
 - (i) pneumatic tyred roller
 - (ii) Beam vibrator (**10marks**)

Question Four

- a) State SIX factors considered when selecting pile driving plant and equipment (**6 marks**)
- b) With the aid of a sketch, briefly explain the operation of:-
 - (i) Drop hammer
 - (ii) Single acting diesel hammer (**14 marks**)

Question Five

- a) Briefly explain the operation of self-propelled pressure sprayer (**5 marks**)
- b) A contractor purchased a plant at a cost of Ksh. 500,000. It's estimated economic life is 10 years .The plant is expected to work for 2000 hours per year. The average rate of depreciation per year is 25%. Assuming salvage value of Ksh. 5000 at the end of 10 years, prepare schedule of depreciation cost of plant using sum of years digit method (**10 marks**)
- c) State FIVE precautions taken while blasting (**5 marks**)