



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

FIRST YEAR THIRD SEMESTER EXAMINATION FOR

DIPLOMA IN BUILDING TECHNOLOGY

DIPLOMA IN CIVIL ENGINEERING

2707/105/CP & 2705/105/CP CONSTRUCTION PLANTS AND EQUIPMENTS

DATE: 15/12/2020

TIME: 2.30-5.30 PM

INSTRUCTIONS TO CANDIDATES

Answer all questions

- 1
 - a) list four excavation plants used in construction site, giving two operations of each (8 marks)
 - b) Briefly explain three method of maintaining plants (9 marks)
 - c) Differentiate between a site dumper and highway dumper (3 marks)
- 2
 - a) With an aid of sketches, discuss three types of forklifts (9 marks)
 - b) Calculate the quantity of concrete produced by a mixer given the following data
Drum discharge output 0.83m
Cycle time 10minutes
Efficiency of the mixer 75%
Working 9 hours
Hired for 6 days (4 marks)
 - c) With an aid of sketches describe the following types of bitumen laying plants
 - i. Sprayer
 - ii. Roller (7 marks)
- 3
 - a) state three advantages of using concrete pumps (6 marks)

- b) With an aid of sketches describe the following types of concreting plants
- i. Pan mixer
 - ii. Tilting drum mixer (6 marks)
- c) State the functions of transporting plants (8 marks)
- 4 a) Differentiate between a scraper and a grader (8 marks)
- b) Sketch a three wheels roller (4 marks)
- c) Differentiate between a guyed derrick and a gantry (7 marks)
- 5 a) The following data was obtained from a manufacturer's specification for a scraper
- | | |
|-----------------------------|---------|
| Scraper capacity = | 8T |
| Haulage speed (full) = | 15km/hr |
| Haulage speed (empty) = | 16km/hr |
| Loading time = | 5min |
| Dumping time = | 1.5min |
| Accelerating/decelerating = | 0.8min |
- If the length of haulage road is 14km and the efficiency of the scraper is 85% calculate the productivity for 9hrs day of the scraper and the number of the scraper required for the project (10 marks)
- b) Differentiate between rotary and percussion method of drilling (6 marks)
- c) Sketch and label dragline (4 marks)