



MACHAKOS UNIVERSITY

University Examinations 2017/2018

SCHOOL OF ENGINEERING
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

SECOND YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL
ENGINEERING

BCECD 216 CIVIL ENGINEERING CONSTRUCTION I

DATE: 15/12/2017

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTION ONE (30 MARKS)

- a) i With the aid of sketches describe four modes of failure of retaining walls (12 marks)
- ii Briefly explain the difference between cofferdams and caissons (4 marks)
- With the aid of sketches describe the following types of foundations
- i Raft foundation (4 marks)
- ii Pad foundation (4 marks)
- b) Briefly describe how traditional wall underpinning is carried out and support your answer with detailed sketches (6 marks)

QUESTION TWO (20 MARKS)

- a) Using well labelled sketches explain each of the following methods of ground water controls
- i Perimeter trench method (5 marks)
- ii Well point method (5 marks)
- b) With the aid of sketches describe the following types of retaining walls
- i Cantilever retaining wall with a large toe (5 marks)

- ii Counter fort retaining wall (5 marks)

QUESTION THREE (20 MARKS)

- a) With the aid of sketches describe the following types of foundations
- i Stepped foundation (5 marks)
 - ii Deep strip foundation (5 marks)
- b) i With the aid of a well labelled describe the sump hole method of dewatering a site (5 marks)
- ii Briefly describe a pneumatic caisson (5 marks)

QUESTION FOUR (20 MARKS)

- a) i Describe with the aid of a sketch the jack pile underpinning method (5 marks)
- ii Briefly describe the electro-osmosis method of dewatering a site (5 marks)
- b) With the aid of sketches describe the following types of cofferdams
- i Cantilever sheet pile cofferdam (5 marks)
 - ii Embankment protected cofferdam (5 marks)

QUESTION FIVE (20 MARKS)

- a) i Briefly explain the effects of ground water behind a retaining wall (4 marks)
- ii Differentiate between active earth pressure and passive earth pressure (4 marks)
- b) Briefly define the following terms
- i Foundation
 - ii Retaining wall
 - iii Underpinning
 - iv Settlement
 - v Dewatering
 - vi Bearing capacity (12 marks)