



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS FOR THE DIPLOMA IN BUILDING AND CIVIL ENGINEERING**

**3<sup>RD</sup> YEAR 2<sup>ND</sup> SEMESTER 2017/2018 ACADEMIC YEAR**

**CENTRE: MAIN CAMPUS**

---

**COURSE CODE: TBC 2322**

**COURSE TITLE: CIVIL ENGINEERING CONSTRUCTION II**

**EXAM VENUE: LAB 23**

**STREAM: DIP IN BLD & CIV ENG**

**DATE: 11/12/2017**

**EXAM SESSION: 9.00 – 10.30 AM**

**DURATION: 1 ½ HOURS**

---

**Instructions**

- 1. Answer question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

**QUESTION ONE (COMPLUSORY) (30 MARKS)**

- a) With the aid of neat sketches, explain any four types of retaining walls (12 Marks)
- b) Explain three dewatering techniques employed in basement construction (3 marks)
- c) State some of the advantages and disadvantages of using Tunnel Boring Machines (TBM) in tunneling (6 Marks)
- d) Determine the total horizontal force acting on a 5m high retaining wall supporting a backfill of internal angle of friction of  $30^\circ$  and a unit weight of  $20\text{kn/m}^3$ . There is a surcharge of  $25\text{KN/m}^2$  on the backfill material ( 6 marks)
- e) Explain any three advantages of reinforced concrete water tanks over plastic water storage tanks. ( 3 marks)

**QUESTION TWO (15 Marks)**

- a) Explain any three ways, giving examples, how tunnels can be classified in civil engineering. ( 3 marks)
- b) Explain the two main purposes of permanent tunnel linings (4 Marks)
- c) Describe any four types of materials used for lining bored tunnels. (8 marks)

**QUESTION THREE (15 Marks)**

- a) Using neat sketches, describe the following types of concrete dams. (9 Marks)
  - (i) Gravity Dams
  - (ii) Arch Dams
  - (iii) Buttress Dams
- b) State some of the advantages and disadvantages of concrete dams ( 6 marks)

**QUESTION FOUR (15 Marks)**

With the aid of neat sketches, where necessary explain the following methods of ground water control in basement construction. (15 Marks)

- a) Sheet Piles
- b) Diaphragm walls
- c) Grouting

**QUESTION FIVE (15 Marks)**

- a) Explain any two scenarios where pile foundations would be more ideal (2 mark)
- b) Differentiate between Displacement and Replacement piles (4 marks)
- c) The cantilever wall shown below is backfilled with material having a unit weight of  $19\text{kn/m}^3$  and internal angle of friction of  $30^\circ$ . Calculate the factors of safety against sliding and overturning. Assume the coefficient of friction as 0.4 and unit weight of concrete as  $24\text{kn/m}^3$ . (9 marks)

