



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

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

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

**2<sup>ND</sup> YEAR 1<sup>ST</sup> SEMESTER 2021/2022 ACADEMIC YEAR**

**SPECIAL EXAMS**

**CENTRE: MAIN CAMPUS**

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**COURSE CODE: TBC 2322**

**COURSE TITLE: CIVIL ENGINEERING CONSTRUCTION II**

**EXAM VENUE: STREAM: DIP. BUILDING AND CIVIL ENGINEERING**

**DATE: .../12/2022 EXAM SESSION:**

**DURATION: 2 HOURS**

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### **Instructions**

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

### QUESTION ONE (COMPULSORY, 30 MARKS)

- a) In Civil Engineering construction, the type and method used in tunnel excavation depend on a number of factors. Explain any four of these factors. **8mks**
- b) Describe in detail, the following underwater construction techniques, stating four advantages of each. **12 mks**
  - i) Caissons
  - ii) Cofferdams
- c) Explain three dewatering techniques employed in basement construction **3 mks**
- d) Briefly explain any two techniques of underwater concreting. **3 mks**
- e) With the aid of neat sketches, describe any two types of retaining walls. **4 mks**

### QUESTION TWO (15 Marks)

- a) A cantilever retaining wall shown in figure 1 is backfilled with material having a unit weight of  $19\text{KN/m}^3$  and internal angle of friction of  $30^\circ$ . Check for the stability of wall against overturning and sliding. Assume the coefficient of friction as 0.4 and unit weight of concrete as  $24\text{kn/m}^3$ . **9 mks**
- b) Describe in detail any four methods of tunnel construction. **6 mks**

### QUESTION THREE (15 Marks)

- a) State any three advantages of using Tunnel Boring Machines (TBM) **3 Mks**
- b) Describe any three tunnel lining techniques **6 Mks**
- c) Enumerate the setting up process of a cofferdam for construction of a bridge pier. **6mks**

### QUESTION FOUR (15 Marks)

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

- 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 mks**
- b) With the aid of neat sketches explain four different types of piles used in building foundation **8 mks**
- c) Explain the two main methods of pile construction. **5 mks**

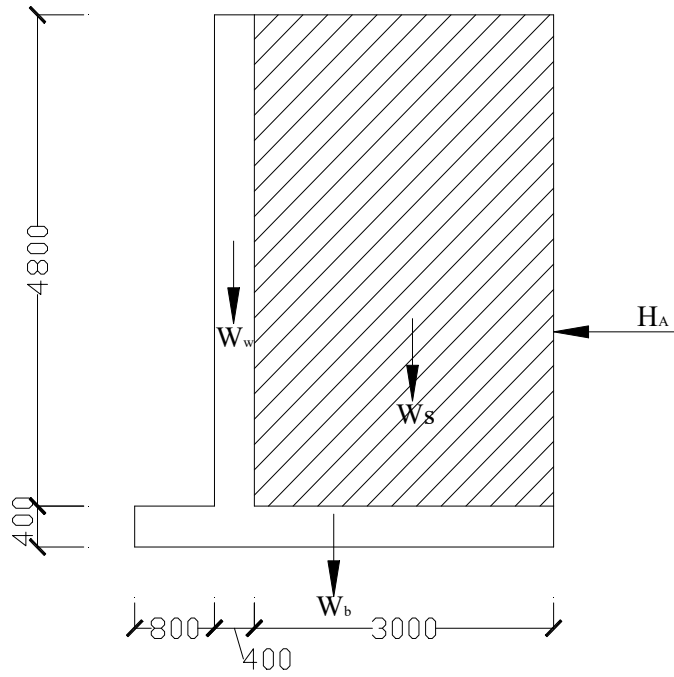


Figure 1, Question 2