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University Examinations 2022/2023

THIRD YEAR, FIRST SEMESTER SPECIAL/SUPPLEMENTARY EXAMINATION FOR CERTIFICATE IN BUILDING AND CONSTRUCTION

ECC 1203: FOUNDATION ENGINEERING

DATE: AUGUST 2023

TIME: 2 HOURS

INSTRUCTIONS: *Answer question one and any other two questions*

QUESTION ONE

A. Define the following terms:

- i. Allowable bearing pressures 2 marks
- ii. Footing 2 marks

B. Name two types of strip foundation. 2 marks

C. State four objectives of foundation 4 marks

D. Name four types of loads designed for in foundation. 4 marks

E. State and explain three classes of timber piles. 6 marks

F. The results of a load test on a 0.45-m-diameter pile are shown in the table below. The displacements were measured at the pile head. By plotting a graph of displacement vs load determine;

Displacement mm	0.0	1.3	2.5	5.1	7.6	10.2	12.7	15.2	17.8	20.3	22.9	25.4	27.9
Load kN	0	200	350	670	870	1070	1250	1400	1500	1600	1700	1750	1780
		30.9	33.0	35.6	38.1	40.6	43.2	45.7	47.0				
		1810	1830	1860	1870	1890	1890	1900	1905				



- i. The ultimate pile load capacity. 6 marks
- ii. The allowable load for a factor of safety of 2, and 2 marks
- iii. The allowable (service) load capacity at 1% pile displacement. 2 marks

QUESTION TWO

- A. Identify the materials used for foundation. 3 marks
- B. State two cases where raft foundation is applicable. 4 marks
- C. Explain the reasons as to why one may consider to use pile foundation. 8 marks

QUESTION THREE

- A. Name three types of loads designed for in foundation. 4 marks
- B. State and explain three classes of timber piles. 6 marks
- C. Illustrate six factors to be considered in the design/depth and construction of foundation. 6 marks

QUESTION FOUR

- A. Name two types of strip foundation. 2 marks
- B. Explain the purpose of doing pile load test. 3 marks
- C. Sketch a well labelled strip foundation. 4 marks
- D. Describe three ways of testing piles before are used in foundation. 6 marks

