



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic Year

DIRECTORATE OF TVET

SECOND YEAR FIRST TERM EXAMINATION FOR

DIPLOMA IN BUILDING TECHNOLOGY

DIPLOMA IN CIVIL ENGINEERING

MEASUREMENT 1

DATE: 28/7/2022

TIME: 8.30-11.30 AM

INSTRUCTIONS

ANSWER ALL QUESTIONS

QUESTION ONE

- a) Define the following terms as used in measurement
- i. Provisional sum
 - ii. Contingency sum
 - iii. Preliminaries
 - iv. Deemed to be included items
 - v. Preambles
 - vi. Prime cost sum (12 marks)
- b) Outline four purposes of bill of quantities in measurement (8 marks)

QUESTION TWO

- a) Explain the three stages involved in the for preparation of a bill of quantities using the traditional method (12 marks)
- b) With an Illustration, describe a dimension paper in measurement (8 marks)

QUESTION THREE

- a) Using a suitable example, illustrate the following in a dimension paper
- i. Grouping of dimensions
 - ii. Dotting on
 - iii. Grouping of descriptions
 - iv. Use of ditto
 - v. Use of ampersand (14 marks)
 - vi. Timesing
 - vii. Alterations to dimensions
- b) Explain two functions of a quantity surveyor during
- i. Preconstruction stage
 - ii. Construction stage (6 marks)

QUESTION FOUR

Take off all the quantities to drawing No.02. (30 marks)

QUESTION FIVE

Explain the following terms giving two examples in each case

- a) Deemed to be included items
- b) Extra over items (10 marks)



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SECOND YEAR FIRST TERM EXAMINATION FOR

DIPLOMA IN BUILDING TECHNOLOGY

DIPLOMA IN CIVIL ENGINEERING

CONCRETE TECHNOLOGY II

DATE: 25/7/2022

TIME: 8.30-11.30 AM

INSTRUCTIONS

ANSWER ALL QUESTIONS

QUESTION ONE

- a) Describe three methods used in concreting under water (6 marks)
- b) With the aid of a diagram, describe the following concreting plants
- Tilting drum mixer
 - Non-tilting drum mixer
 - Pan mixer (14 marks)
 - Central mixing plant

QUESTION TWO

- a) Give six personal safety requirements to be observed while concreting (12 marks)
- b) Outline four differences between insitu concrete and precast concrete (8 marks)

QUESTION THREE

- a) Describe with a diagram, the following methods of prestressing concrete
- Pre-tensioning
 - Post tensioning (6 marks)
- b) Explain four factors affecting the productivity of a concrete plant (8 marks)
- c) Outline two differences between prestressed concrete and reinforced concrete (6 marks)

Examination Irregularity is punishable by expulsion

QUESTION FOUR

- a) Describe the procedure used in the production of precast concrete units (8 marks)
- b) Give four plant safety requirements to observed while concreting (8 marks)
- c) Give two advantages of using precast concrete units (4 marks)

QUESTION FIVE

- a) The volume of concrete to be used for foundation casting is 450M^3 , the concrete mixer has a bucket capacity of 0.34M^3 . If it works for 50 Minutes in 1 hour and 9 hours per day, how many days will it take to complete casting of the foundation. (8 marks)
- b) Describe with a diagram, two types of concrete joints (8 marks)
- c) Explain the two processes of forming a concrete joint. (4 marks)



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CONSTRUCTION MANAGEMENT 11

DATE: 27/7/2022

TIME: 8.30-11.30 AM

INSTRUCTIONS

ANSWER ALL QUESTIONS

QUESTION ONE

- a) Give five characteristics of a project (10 marks)
- b) Describe the two types of project classification giving two examples in each (6 marks)
- c) Outline four benefits of project management approach (4 marks)

QUESTION TWO

- a) Explain the term construction planning (2 marks)
- b) Give six objectives of construction planning (12 marks)
- c) Describe the three stages of construction planning (6 marks)

QUESTION THREE

- a) Explain the term scheduling in construction management (2 marks)
- b) Give six reasons for construction scheduling (6 marks)
- c) Illustrate a labour schedule for the construction of a reinforced retaining wall (12 marks)

QUESTION FOUR

- a) Explain the following terms used in critical path method of network diagram
- i. Activity
 - ii. Event
 - iii. Network
 - iv. Dummy
 - v. Constraints
 - vi. Duration (12 marks)
- b) Give four objectives of critical path method (8 marks)

QUESTION FIVE

- a) Give four differences between critical path method and performance evaluation technique (8 marks)
- b) Draw the network for the following logic
- i. Activity A follows B and activity C and D
 - ii. Activity C can start only after completion of B and D
 - iii. Activity A can start only after completion of B and D (8 marks)
- c) State two events and two activities (4 marks)



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SECOND YEAR SECOND TERM EXAMINATION FOR

DIPLOMA IN BUILDING TECHNOLOGY

DIPLOMA IN CIVIL ENGINEERING

WATER SUPPLY

DATE: 26/7/2022

TIME: 2.30-5.30 PM

INSTRUCTIONS

ANSWER ALL QUESTIONS

QUESTION ONE

- a) Define the following terms and give their s.i units
- Capillarity
 - Vapour pressure
 - Viscosity
 - Compresibility
 - Surface tension (10 marks)
- b) A mercury manometer is used to measure in pipe as shown below the flowing liquid is water and manometer liquid is mercury.
- Calculate gauge pressure at A
 - If atmospheric pressure is 101.3KN/M^2 , calculate the absolute pressure (8 marks)
- c) Differentiate between an ideal fluid and a real fluid (2 marks)

QUESTION TWO

- a) A differential manometer connected at two points A and B at the same level in a pipe containing an oil of specific gravity 0.8, shows a difference in mercury levels as 100mm. Determine the difference in pressure at the two points. (8 marks)
- b) Define Bernoulli's equation (2 marks)
- c) With the aid of a diagram, derive the Bernoulli's equation (10 marks)

QUESTION THREE

- a) Give five Bernoulli's assumptions (5 marks)
- b) Define the term rate of discharge giving its S.I unit (3 marks)
- c) Describe the following types of flow
- i. Streamline flow
 - ii. Steady flow
 - iii. Turbulent flow
 - iv. Unsteady
 - v. Uniform flow (12 marks)
 - vi. Non uniform flow

QUESTION FOUR

- a) A pipe of 100mm diameter branches into two pipes of diameters 100mm and 50 mm respectively. The flow in the larger branch pipe is $\frac{2}{3}$ of the main pipe and the remaining discharge is through the smaller branch pipe. Determine the rate of flow in the main pipe, if average of flow in any of the pipes is not to exceed 3m/s. (10 marks)
- b) A siphon has a circular hole of 75mm diameter and consists of a pipe with a crest 1.8m above water level discharging in atmosphere at a level 3.6m below water level. Determine:
- i. Velocity of flow
 - ii. Discharge
 - iii. Absolute pressure at crest level if atmospheric pressure is 10M of water (Neglect losses due to friction) (10 marks)

QUESTION FIVE

- a) with the aid of a diagram describe the following pressure measuring devices
- i. Vertical tube Micro Manometer
 - ii. Diaphragm pressure gauge
 - iii. Inverted differential manometer (15 marks)
- b) In order to determine the pressures in a pipe, containing liquid of specific gravity 0.8, a micro manometer was as show in the Fig. 03. The ratio of the base to that of the limb is 50. Find the intensity of pressure in the pipe for the manometer readings as shown in the figure. (5 marks)



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DIPLOMA IN CIVIL ENGINEERING

CIVIL ENGINEERING CONSTRUCTION AND DESIGN

DATE: 25/7/2022

TIME: 11.30-2.30 PMJ

INSTRUCTIONS

ANSWER ALL QUESTIONS

QUESTION ONE

- a) Describe with a diagram, the following types of retaining walls
- i. Gravity retaining wall
 - ii. Reinforced concrete retaining wall
 - iii. Sheet pile retaining wall (10 marks)
- b) Explain with a diagram four failure modes of retaining walls (10 marks)

QUESTION TWO

- a) Give three functional requirements of a foundation (6 marks)
- b) With the aid of a diagram, describe the following types of foundation
- i. Deep strip
 - ii. Slab and beam raft
 - iii. Cellular foundation
 - iv. Pile foundation (14 marks)

QUESTION THREE

- a) Describe six factors affecting the selection of a dam site (12 marks)
- b) Explain four factors affecting the selection of a reservoir site (8 marks)

QUESTION FOUR

- a) with the aid of a diagram, describe two methods used in tunnel construction (10 marks)
- b) Give four problems encountered during tunnel construction (4 marks)
- c) List six objectives of lining in a tunnel (6 marks)

QUESTION FOUR

With the aid of a diagram, describe the following types of waterfront structures

- a) Seawall
- b) Jetty
- c) Breakwaters
- d) Dry dock (20 marks)