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# Daffodil International University

B. Sc. in Civil Engineering

Mid Term Examination, Spring - 2025

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|---|---|---|
| Course Code: CE 201 | Course Title: Engineering Materials | |
| Section: BN1 & BN2 | Level-Term: 2-1 | Teacher's Initial: AU |
| Full Marks: 25 | Date: March 11, 2025 | Time: 1.5 Hours |

***Note: There are six questions in total. Answer all of them. Right hand margin indicates full marks.***

1. The initial weight of a sample of powdered limestone is 430 grams, and the weight of the dried residue on filter paper is 110 grams. The residue after decantation and drying weighed 55 grams. *Calculate* the percentage of carbonate, sand, and clay present in the sample of limestone. ***[CO2, C3]*** [03]

2. *Write* down the uses of Mortar. ***[CO1, C1]*** [02]

3. *Write* short note on any four of the following: ***[CO1, C1]*** [08]

   I. Bulking of Sand
   II. Field Tests of Bricks
   III. Hydration of Cement
   IV. Harmful Constituents of Bricks
   V. False Setting of Cement
   VI. Slag Cement

4. For a bridge construction project, the recommended FM for sand is 2.5. From a nearby market, two sand samples (sand-1 and sand-2) were collected. The samples were sent to the Concrete Laboratory of Daffodil International University of Bangladesh for sieve analysis. The sieve analysis data are given. [07]

| Sieve Size (mm) | Materials Retained (gm) Sand-1 | Materials Retained (gm) Sand-2 |
|---|---|---|
| 25 | 20 | 23 |
| 16 | 22 | 38 |
| 4.75 | 17 | 31 |
| 2.36 | 56 | 20 |
| 1.19 | 48 | 25 |
| 0.59 | 15 | 13 |
| 0.4 | 50 | 20 |
| 0.15 | 10 | 10 |
| 0.075 | 42 | 40 |
| Pan | 0 | 0 |

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(i) *Calculate* FM of the sand samples.

(ii) In what proportions, the sand samples are to be mixed to get the recommended FM?

(iii) Comment on the samples based on the sieve analysis data. *[CO2, C3]*

5. *Illustrate* the figure of rule pointing and cut pointing. **[CO1, C2]** [02]

6. *Illustrate* the flow chart of the wet process for the manufacturing of cement. **[CO1, C2]** [03]

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