B. Sc. in Civil Engineering
Final Examination, Fall - 2024

Course Code: CE 203	Course Title: Engineering Geology and Geomorphology	
Section: BN1 & BN2	Level-Term: 2-1	Teacher's Initial: MTI, SS
Full Marks: 40	Date: December 21, 2024	Time: 2 Hours

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

1. a) Define "The Rational Method" and "River transportation". List the assumptions made in Rational Method. Identify the factors affecting a river's transportation power. [1+1+2+2] *[CO1, C1]* [06]

   b) Define geomorphology and the role of gravity as a geomorphic agent. [1+1] *[CO1, C1]* [02]

2. a) Explain the following drainage patterns with neat sketches: [1+1] *[CO2, C2]* [02]
   (i) Rectangular
   (ii) Trellis

   b) The central field of DIU has been redesigned to represent the Bangladesh flag in honor of the July Revolution. The layout consists of three zones: the Central Red Zone (dark area) with a runoff coefficient of 0.34, the Green Outfield (white area) with a runoff coefficient of 0.55, and the Rigid Pavement (diagonal stripe area) with a runoff coefficient of 0.95. [06]

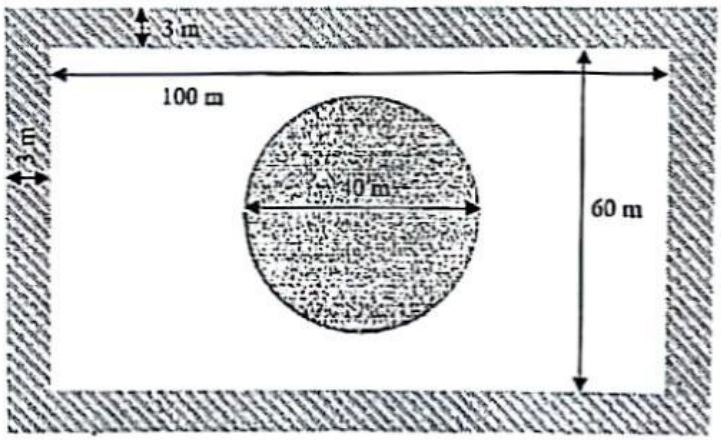

Figure 2(b): Central field of DIU

If the rainfall intensity is 20 in/hr, estimate the total discharge using the Rational Method. Dimensions are provided in *Figure 2(b). [CO2, C2]*

3. a) Explain "Capacity" and "Competence" in the context of river transportation. [2+2] [04]
[CO3, C2]

b) Explain "Liquefaction" and "Landslides" as seismic hazards. [2+2] [04]
[CO3, C2]

c) Identify different types of folds. Explain significance of folds in practical engineering applications. *[CO3, C2]* [04]

d) Review the earthquake zoning map of Bangladesh as proposed in the updated Bangladesh National Building Code (BNBC) 2020 with illustration and analyze why the zone coefficient values change in different regions of Bangladesh. *[CO3, C2]* [04]

e) Describe the processes and characteristics of the following features associated with alluvial land formation: [1+1+1+1] *[CO3, C2]* [04]

(i) Meandering River

(ii) Oxbow Lake

(iii) Cutoff

(iv) Natural Levee

f) Identify the type of fault illustrated in *Figure 3(f)* providing justified reasoning for your conclusion. Explain the significance of faults in practical engineering applications. *[CO3, C2]* [04]

Figure 3(f): Example of fault