**BANGLADESH UNIVERSITY OF PROFESSIONALS**
**Military Institute of Science and Technology**
**B.Sc. in Environmental, Water Resources, and Coastal Engineering, Term Final (Fall) Examination 2024: April 2025**

**Student Group: 36<Earned Credit Hours ≤ 72**

**Subject: EWCE 203, Geology and Geomorphology**

**Time: 3.00 hours** **Full Marks: 180**

**INSTRUCTIONS:**

a. Use **SEPARATE** answer scripts for each section.
b. **Question-1** in **Section-A** and **Question-5** in **Section-B** are compulsory.
c. Answer any other **TWO** out of the remaining **THREE** questions from each section.
d. Figures in the margin indicate full **marks**.
e. Draw reference sketches/diagram where necessary.
f. **Symbols** and **abbreviations** used have their usual meanings.

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## SECTION-A

**Question 1 (Compulsory)**

a. Define geology. As a student of engineering why do you need to study geology? **05**

b. Write down your understanding about 'geologic time scale (GTS)'. Briefly describe the importance of GTS in the study of geology. **05**

c. Define volcanoes. Why do the volcanoes remain active? Briefly describe the different types of volcanic erruptions. **05**

d. Explain the term 'metamorphism'. Briefly describe the different agents of metamorphism.

e. Differentiate between joints and faults in the structural geology. How the joint sets are developed in different rocks? **05**

f. Define seismicity in Bangladesh. Explain why Bangladesh is so vulnerable to earthquake in the world. **05**

**Question 2**

a. Write down your understanding about 'sea-floor spreading'. Why the seafloor spreading is significant in studying geology? Briefly describe the causes of seafloor spreading. **12**

b. Define minerals. How does the mineral differ from the mineraloids? Describe in brief the following physical properties of minerals: **08**
   i) Color
   ii) Striation
   iii) Cleavage
   iv) Hardness

c. Briefly describe the different types of sedimentary rocks based on the environment on which sediments are accumulated. Describe the lithification process to transform the sediments to rocks. **10**

**Question 3**

a. Briefly describe the composition and structure of the earth. Define lithosphere and asthenosphere. How these two are related to the tectonic plate movement and the earthquake? **10**

b. Define structural geology. Briefly describe the dip and the strike which are used in orienting structural geology. Differentiate between the followings: **10**

i) Overturned fold and recumbent fold.
ii) Dome and basin.

c. Write down your understanding about the earthquake. If a major earthquake strikes Bangladesh with the epicenter within the country, describe in brief the likely effects of such earthquake in Bangladesh. **10**

**Question 4**

a. Define non-feromagnesian silicate minerals. Briefly describe the following minerals with their uses: **10**

i) Muscovite
ii) Feldspar
iii) Quartz

b. Write down your understanding about 'seismic waves'. Briefly describe the different types of seismic waves with their propagation. Which of the seismic waves cause maximum damages to the structure and why? **12**

c. Briefly describe the four distinct regions of geology of Bangladesh, having distinct characteristics of its own. **08**

## SECTION-B

**Question 5** **(Compulsory)**

a. Define geomorphology and describe the principle zones of Earth. **10**

b. Briefly describe the three components of the total flow of water and describe how, type of precipitation, rainfall intensity, duration of rainfall and soil moisture deficiency affect runoff. **14**

c. Determine the form factor and compactness coefficient of the basin given in Figure 1 **06**

**Question 6**

a. Demonstrate the water cycle with explanation. **10**

b. Describe wind erosion and water erosion. **12**

c. Determine the expected runoff by rational method from a concrete pavement (runoff coefficient 0.80) 4000m long and 200m wide during a rainfall of 5mm/hr. **08**

**Question 7**

a. Define bed load. Hence, describe the ways of movement of bed load. **08**

b. Discuss one difference and one similarity between weathering and erosion. Hence state how these two processes help each other. **06**

c. Briefly describe four factors affecting valley widening. Hence, classify valley based on genetic classification. **16**

**Question 8**

a. Differentiate between floodway and flood fringe. Delineate the formation of an alluvial plain. **14**

b. Define rational method. Hence, state two assumptions of rational method. **04**

c. Describe Diastrophism and Vulcanism. Hence, classify the geomorphic process according to origin giving an example for each **12**

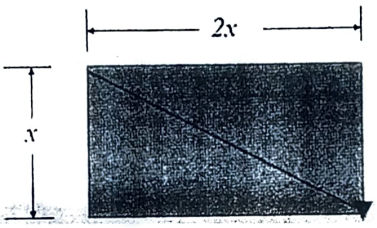



Figure 1 for Question 5 (c)