

University of Asia Pacific
Department of Civil Engineering
Final Examination Fall 2012
Program: B.Sc. Engineering (Civil)

Course title: **Introduction to Civil and Environmental Engineering**

Time: **2 hours**

Course: **CE 107 Section (A)**

Total Marks: **50**

Section A (Total Marks 15)

Answer any **THREE**.

1. a) While designing a structure, which factors a structural engineer should keep in mind? (3)
b) If someone asks you about the tasks of a 'civil engineer', what would be your answer? (2)
2. a) Write down the different steps involved in 'structural' design process. (3)
b) List the different types of structural members. (2)
3. Give brief description of the four basic types of structures. (5)
4. a) Differentiate between 'dead load' and 'live load' with examples. (3)
b) Define 'engineering ethics' and mention how you would apply it as an engineer. (2)

Section B (Total Marks 35)

5. Describe the following (any two): (2x2=4)
 - a. Values knowledge and social justice as an environmental issue
 - b. Age Structure
 - c. Biodiversity
 - d. Water resources in Bangladesh
6. Assume that a population follows a simple logistic growth curve. Find the maximum sustainable yield as a function of carrying capacity, the current population size and current growth rate. (3)
7. Suppose the fish population in a pond follows a logistic curve until it stabilizes at 15,000. This year the numbers of fishes are 5,000 and its growth rate is 1.7%. When the fish number will reach 7,500 and 14000? (3)
8. Define water pollution? Write any four different categories of water pollutant along with their sources and impact. (2+4=6)

9. Define ecosystem and its components? (2)
10. If flood water puts raw sewage into a natural flowing stream what will be the possible relationship between dissolve oxygen and biochemical oxygen demand (BOD) along the up and downstream from the point of pollution. (3)
11. Show in a schematic diagram how photochemical and sulfurous smog develops? (4)
12. Answer any two of the following: (5x2=10)
- Briefly discuss the important urban environmental issues in Bangladesh. Show in a schematic diagram how photochemical and sulfurous smog develops?
 - What are the general effects of air pollution? Describe different sources of air pollution.
 - Discuss the possible adaptation measures that can be taken against the negative impacts due to sea level rise in Bangladesh.

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Section A (Total Marks 15)

Answer any **THREE**:

1. Briefly discuss the important urban environmental issues in Bangladesh. Show in a schematic diagram how photochemical and sulfurous smog develops? (5)
2. What are the general effects of air pollution? Describe different sources of air pollution. (5)
3. Discuss the possible adaptation measures that can be taken against the negative impacts due to sea level rise in Bangladesh. (5)
4. Define global warming. "The trapping heat in the atmosphere is somewhat analogous to a greenhouse" – explain. (5)

Section B (Total Marks 35)

(Answer question 5 and any three from questions 6 to 9)

5. What are the functions of a 'Civil Engineer'? What do you understand by 'Engineering Ethics' and how would you apply it in your engineering career. (5)
6. a) What are the functions of soil compaction? List different equipment used for soil compaction in the field. (3)
b) Define the following terms: (4.5)
 - i. Optimum moisture content
 - ii. Unified soil classification system
 - iii. Sieve analysis
- c) What type of information does a geotechnical engineer need to collect for a geotechnical project? (hint: soil strength) (2.5)
7. a) What are the functions of a 'Traffic Engineer'? (3)
b) What does 'ITS' stand for? List 5 applications of ITS. (3)

- c) Provide brief description of **any** of the following document: (4)
- i. Bangladesh National Building Code
 - ii. Dhaka Metropolitan area integrated transport study
 - iii. Dhaka Urban Transport Network Development Study
8. a) Give brief description of the following tests: (4)
- i. Standard proctor test
 - ii. Modified proctor test
- b) If you are assigned the job of a 'Pavement designer', what tasks would you do? (3)
- c) While designing a structure, which factors a structural engineer should keep in mind? (3)
9. a) Define 'Operation Research'. Draw the flow chart showing the systems approach in Transport planning. (4)
- b) Differentiate between: (3)
- i. Live load and Dead load
 - ii. Cable and Arch
- c) How would you define 'Transportation Engineering'? What are the characteristics of an acceptable transport system'? (3)