

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) What is the importance of Environmental Engineering for planning of a sustainable city? Explain. (10)
- (b) Why is the water demand of a developed country much higher than that of a developing country? Explain with examples. (7)
- (c) State the minimum requirements for a fire hydrant. (3+15)

How does the variations (hourly, daily and seasonal) in water use affect the design of following components of a water supply system?

- (i) Pipe line
(ii) Water Reservoir and
(iii) Pump

How is this issue taken care of in designing those components?

2. (a) Describe the role of a planner to make a Water Supply Project successful for a fast growing city. (12)
- (b) What factors influence the water demand? (5)
- (c) The population of a small old town during the past four decades are shown in the following table. Estimate its population for the year 2030 by Geometric Progression method and Arithmetic Progression method. Which estimate seems to be realistic to you and why? (18)

Year	1980	1990	2000	2010
Population	50,000	58,200	69,500	85,000

3. (a) Write a brief description on the suitability of using groundwater as a domestic water source for Bangladesh. (12)
- (b) Why is the efficiency of removing physical and bacteriological impurities of Slow Sand Filter (SSF) higher than that of Rapid Sand Filter (RSF)? (5)
- (c) A rapid sand filter is to be designed for a capacity of 27000 m³/day. What should be the number and size of units? Calculate the percentage of filtered water required to wash the filter bed and the capacity of the wash water tank. Assume, rate of filtration: 5 m³/m²/hr, rate of washing: 35 m³/m²/hr, length of filter run: 24 hr including 5 min for filter washing and 10 min for resettlement of sand bed. (18)

CE 471/URP

4. (a) Make a comparison among the following disinfectants: **(15)**
(i) Disinfection by UV (ii) Chlorine di Oxide (ClO₂)
(iii) Chloramines (iv) O₃ and (v) Bleaching Powder.
- (b) What are the purposes of a Water Distribution System? **(12)**
State the procedure that should be followed in designing of a Water Distribution System.
- (c) Determine the size of a rectangular sedimentation tank to treat 1.8 million litres of raw water per day. The detention period is 4 hours and surface over flow rate should be less than 40,000 l/m²/day. **(8)**

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) List the major issues that must be considered during the planning of Sanitation program? Explain with reasons. **(18)**
(b) What are the components of a composting toilet? Explain how the various environmental factors affect composting process. **(17)**
6. (a) List the various factors influencing the Sanitation technologies in Bangladesh. Explain with reasons how they influence in the context of Bangladesh. **(18)**
(b) In a diagram show a simple pit latrine. Show the essential components with labels. What are the advantages and disadvantages of a simple pit latrine? **(17)**
7. (a) What is a Septic tank? Why and where is it used? **(5)**
(b) In a neat sketch show the different components of a septic tank. **(6)**
(c) Explain the different processes in a septic tank. **(9)**
(d) What factors influence the performance of a septic tank? **(5)**
(e) Explain the steps for the design of a septic tank. **(10)**
8. (a) What are the functional elements of a Solid Waste Management System (SWM)? Describe the various landfill methods along with their suitability. **(5+9)**
(b) Write short notes on the following: **(9)**
(i) Hauled Container System (HCS)
(ii) Solid Waste Transfer Station
(iii) Equivalent Sound Level (L_{eq}).
- (c) (i) Describe the mechanism of depletion of Ozone layer with chemical reaction. **(3)**
(ii) What are the major sources of air pollution? Show with a diagram. **(3)**
(iii) A train whistle noise level was measured with a noise meter to be 70 dB at 100 m distance. What would be the sound level at 500 m from the train? **(6)**
-

Sub: **PLAN 451** (Environmental Planning and Management)

Full Marks: 210

Time: 3 Hours

The figures in the margin indicate full marks.

Symbols indicate their usual meaning.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – AThere are **FOUR** questions in this section. Answer any **THREE**.

1. (a) Bangladesh government has imposed a 22-day ban on Hilsa fishing in 27 districts in a bid to increase the population of the popular fish species which contributes one percent of the country's GDP. The objective of the restriction is to save the mother Hilsa which lays eggs during the time. Fishermen on the Padma and Meghna rivers are also forbidden from using fishing nets. In this scenario, explain the following terms. **(3+5+5=13)**
 - (i) Common pool resource
 - (ii) Tragedy of commons
 - (iii) Prisoner's dilemma
- (b) Define major characteristics of hazardous waste. Discuss 3R Model of waste management. **(5+10=15)**
- (c) What is carbon sequestration? Discuss the importance of different types of carbon sequestration in environmental planning. **(3+4=7)**
2. (a) Draw a schematic diagram of EIA (Environmental Impact Assessment) process. **(10)**
- (b) Compare between proactive and integrative environmental planning in the context of Bangladesh. **(5)**
- (c) Briefly describe the environmental tools which can be used in the scoping exercise. **(16)**
- (d) What do you understand by NIMBY? Explain with examples. **(4)**
3. (a) Define carrying capacity, ecological footprint and sustainability. Explain the relationship among them with example. **(2+2+2+9=15)**
- (b) Compare between EIA (Environmental Impact Assessment) and IEE (Initial Environmental Examination) with example. **(5)**
- (c) Using the Table 1, calculate and interpret the AQI value for a certain area where reading for concentration of different pollutants in the ambient air were: **(10+5=15)**
 - (i) O_3 (8 hours) = 0.106 ppm
 - (ii) CO = 10 ppm
 - (iii) NO_2 = 0.70 ppm

PLAN 451

Contd... Q. No. 3(c)

Table 1: Breakpoints for the AQI

This Breakpoint...					...equal this AQI		
O ₃ (ppm) 8-hour	O ₃ (ppm) 1-hour ¹	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	CO (ppm)	SO ₂ (ppm)	NO ₂ (ppm)	AQI
0.000 - 0.064	-	0 - 54	0.0 - 15.4	0.0 - 4.4	0.000 - 0.034	(²)	0 - 50
0.065 - 0.084	-	55 - 154	15.5 - 40.4	4.5 - 9.4	0.035 - 0.144	(²)	51 - 100
0.085 - 0.104	0.125 - 0.164	155 - 254	40.5 - 65.4	9.5 - 12.4	0.145 - 0.224	(²)	101 - 150
0.105 - 0.124	0.165 - 0.204	255 - 354	65.5 - 150.4	12.5 - 15.4	0.225 - 0.304	(²)	151 - 200
0.125 - 0.374 (0.155 - 0.404) ⁴	0.205 - 0.404	355 - 424	150.5 - 250.4	15.5 - 30.4	0.305 - 0.604	0.65 - 1.24	201 - 300
(³)	0.405 - 0.504	425 - 504	250.5 - 350.4	30.5 - 40.4	0.605 - 0.804	1.25 - 1.64	301 - 400
(³)	0.505 - 0.604	505 - 604	350.5 - 500.4	40.5 - 50.4	0.805 - 1.004	1.65 - 2.04	401 - 500

4. (a) Describe the difference between ECC (Environmental Clearance Certificate) issuance process of Amber A and Amber B category project with schematic diagram. (16)
- (b) Discuss the environmental stresses existing in Bangladesh with necessary examples. (15)
- (c) Describe the considerations in impact prediction of the process of EIA (Environmental Impact Assessment) with example. (4)

SECTION - B

There are **FOUR** questions in this section. Answer any **THREE**.

The terms and abbreviations have their usual meaning.

5. You are working as a town planner in a pourashava of Bangladesh.
- (a) The Mayor of the pourashava wants to know about different aspects of environmental and ecological planning.
- (i) Explain in brief to him 'feedback loops', 'stability of system', 'Green and Brown Agenda'. (3×4=12)
- (ii) The mayor thinks green and brown agenda of a city contradicts each other. Explain how you could integrate them. (8)

PLAN 451

Contd... Q. No. 5

- (b) You have been assigned by the mayor to conduct 'ecological planning' of the pourashava. What are the methods you could pursue to conduct the task? Explain in brief, the salient features of each of these approaches. **(15)**
6. You are working as a member of the team which is preparing policy for sustainable regional development.
- (a) While working, one of the first problems you face was to explain the term 'sustainable development' to the members who have background in economics and ecology. Explain to them how economists and ecologists define sustainable development. **(3 ½ × 2 = 7)**
- (b) Your team has recommended to conduct a Strategic Environmental Assessment (SEA) of the policy, they proposed. However, the secretary of the ministry was telling why is it required to conduct a SEA when all the projects would conduct EIA. Explain to him why SEA is required to be conducted and describe to him the differences between EIA and SEA. **(12+16=28)**
7. (a) Write short notes on **(6×4=24)**
- (i) Brundtland Commission Report
 - (ii) Green Space Factor
 - (iii) Urban Forestry
 - (iv) Environmentalism in the 1800s.
- (b) What are the challenges an urban planner is facing to promote urban agriculture in RAJUK area? **(11)**
8. (a) While working in a development authority as an authorized officer you received a file for planning permission of a hazardous industry. What are the factors would you consider before issuing planning permit? **(12)**
- (b) Explain the challenges Bangladesh is facing for implementing 'National Strategy for Sustainable Development 2009'. **(14)**
- (c) Explain the different types of watershed management strategies that has been practiced in Bangladesh with example. **(9)**
-

Sub: **PLAN 401** (Project Evaluation and Management)

Full Marks: 210

Time: 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – AThere are **FOUR** questions in this section. Answer any **THREE**.

1. (a) "Social cost and benefit differ from monetary cost and benefit of a project" — Do you agree with this statement? Justify your answer. (18)
- (b) Suppose you want to borrow 2,500,000 BDT to invest in a project of your firm. You approach a bank which charges 14 percent interest semi-annually. You can pay 380,000 BDT per year toward loan amortization. What should be the maturity period of the loan? (12)
- (c) "Risk is inherent in every decision regarding project" — Describe the sources of these risks. (5)
2. (a) "Financial issues are the most important factors while selecting a project or deciding on the success of a project." — Do you agree with this statement? Justify your answer. (12)
- (b) Suppose you are considering two projects. Project 1 is planning for affordable housing in Purbachal New Town and Project 2 is planning for waste management in Dhaka city. The expected cash flows of these projects are shown in Table 1.

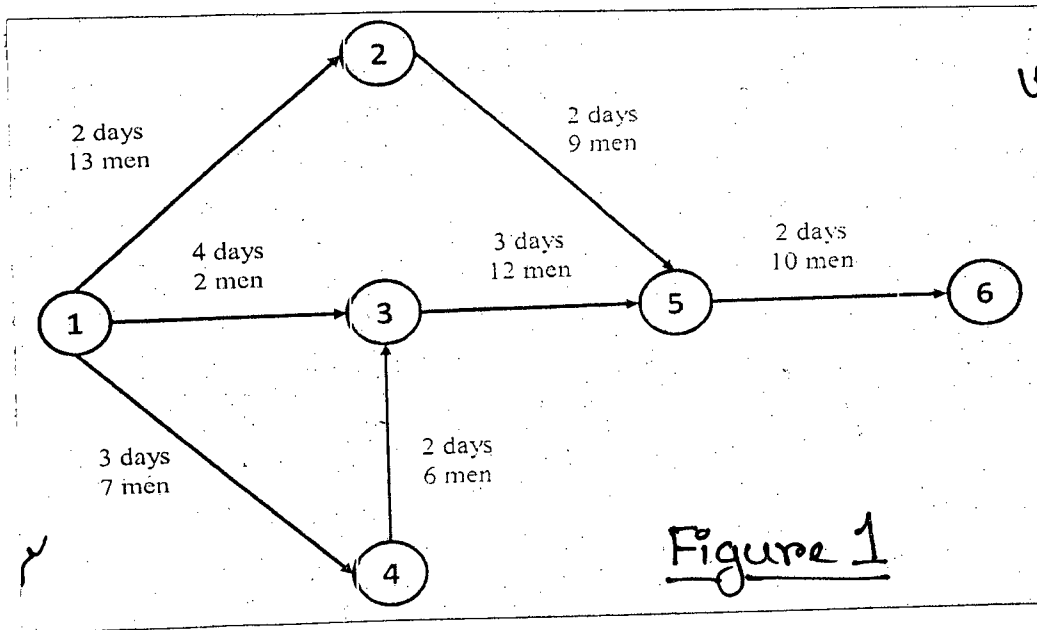
Table 1

Year	Cash flow in million BDT	
	Project 1	Project2
0	100	50
1	20	20
2	50	50
3	100	80
4	250	60

- (i) Calculate NPV and BCR of these projects considering cost of capital 15%. (10+5=15)
- (ii) Based on your answer in (i) which project would you choose between them? Justify your answer. (8)

PLAN 401

3. (a) Figure 1 shows the network diagram of a project with activity duration and manpower requirement.



- (i) Draw early start schedule of the project. (5)
 - (ii) Draw the feasible schedule of the project considering only 15 men are available per day. (5)
 - (iii) Compare the early start schedule and the feasible schedule of the project obtained from (i) and (ii). (8)
- (b) Describe the advantages and disadvantages of using accounting rate of return to select a project for investment. (12)
- (c) Explain- how can we conclude about whether a project is successful or not. (5)
4. (a) "Projects have impact on labor market." — Explain how would you obtain and measure such impacts of a project. (5)
- (b) The normal and crash times and direct costs of a project are shown in Table 2. Determine all normal and critical path. Compare total costs for these project schedules if the indirect costs are 1000 BDT per week. (30)

Table 2

Activity	Time (in week)		Cost (in BDT)	
	Normal	Crash	Normal	Crash
(1-2)	8	5	6000	9000
(2-4)	6	2	6000	9200
(1-3)	6	2	15000	18000
(3-4)	3	1	4000	4900
(3-5)	3	1	3000	4200
(4-5)	8	3	4000	8500

PLAN 401

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) Define "Project", "Program" and "Portfolio". (9)
(b) Draw the "Project Cycle" and briefly describe each stage of the cycle. (15)
(c) State the functions of Project Management. Explain why Time, Cost and Quality are important elements of Project Management. (5+6=11)
6. (a) Explain why stakeholder analysis is not only important, but also essential during Project Design. (8)
(b) Suppose, a project has been considered to resolve the transportation problem in Dhaka. As the project planner-
(i) Prepare a problem tree. (5)
(ii) Prepare an objective tree. (5)
(c) What are the components to be included in the Project Feasibility Report? And explain why social and Environment impact study are required to examine the viability of a project. (10+7=17)
7. (a) Describe the importance of project monitoring and evaluation. Also explain the differences between the two. (4+4=8)
(b) Describe the steps of Development Project Proforma (DPP) approval process. Consider the project will be finance by the Government fund. (15)
(c) State, under what circumstances can "Direct Procurement Method (DPM)" be acceptable by project authority. (12)
8. (a) Describe the difference between-
(i) RFQ and RFP. (5)
(ii) Single State-Single Envelope and two stage tendering method. (5)
(b) Suppose a project is taken by the government to develop Landuse map for an area. Project agency invite proposals from Consulting Firms. Five firms have submitted their technical and financial proposals. After evaluation, points given to their proposals by the evaluation committee are provided in table 1 and table 2. Which of the firms would you recommend as a procuring entity on the basis of-
(i) Quality and Cost Based Selection (QCBS) consider relative weights of cost and quality 80% and 20% respectively. (15)

PLAN 401

Contd... Q. No. 8(b)

- (ii) Find Budget Selection (FBS). Consider the budget for the assignment is 4.4 billion BDT. (5)
- (iii) Least Cost Selection (LCS). (5)

Consultant	Specific Experience	Adequacy of Methodology and Work Plan	Key Staff Qaulification	Transfer of Knowledge
A	8	20	32	5
B	7	35	37	3
C	10	40	25	7
D	6	25	40	9
E	8	15	35	8

Consultant	Proposed Cost (in billion BDT)	Point
A	4.6	76
B	3.9	90
C	4.2	83
D	4.5	78
E	3.5	100

SECTION – A

There are **FOUR** questions in this section. Answer any **THREE**.

1. (a) History of modern town planning laws starts with public health regulations. Now after several phases and addition focus of planning laws again comes to public health (and wellbeing). Keeping this statement in mind discuss the chronological changes in modern planning legislations. (18)

(b) The constitution of the Peoples Republic of Bangladesh has declared several fundamental rights for the citizens of the country. List out the rights. (17)
2. (a) There are ten different, but overlapping, concepts of equity, fairness and justice. Discuss them with examples in the context of urban and regional planning. (27)

(b) When RAJUK ordered a plot and building owner to lower the height of the building by removing couple of top floor upon requirement for civil aviation, the owner went to the court and RAJUK lost the case. Briefly describe the logic considered by the court in this case. (8)
3. (a) Both High Court and Supreme Court of Bangladesh have ordered for removing BGMEA building from its existing site. High Court in its verdict considered the ownership of land, hand over process of ownership, RAJUK's approval process of the building, etc. Explain the facts and laws based on which courts ordered for the demolition of the building. (18)

(b) In the court cases regarding creation of new plots and construction of walkways along Gulshan and Uttara lakes, cutting trees in Purbachal area to create plots court observed that there should be limit in 'Legitimate Expectation'. Describe to what expectations the courts were referring to and in which logic court denied those expectations. (4+6)

(c) Name the documents required to purchase and register land or flat in Bangladesh. (7)
4. (a) In cases of several public interest litigations, courts made observations and put directions beyond the very issue of the case or dispute. Give examples of two such observations and briefly describe the issues of the court cases. (14)

PLAN 403

Contd... Q. No. 4

(b) Expert opinion becomes crucial in resolving several land use and transport development issues in the court. Such opinions were sought in Modhumoti Model Town case and rickshaw ban case. Briefly discuss the aspects on which experts were asked to give their opinion. Were opinions considered finally in court's ruling or verdict for these two cases? (12)

(c) Give an example when prevailing socio-economic or technological advancement is considered and incorporated in law(s). (9)

SECTION – B

There are **FOUR** questions in this section. Answer any **THREE**.

5. (a) What is "betterment fee"? Do you think it is necessary to impose? Why? (5)
- (b) Under which circumstances T1 Act 1953 has given power to initiate "improvement schemes and rehousing schemes"? Do you think RAJUK has the legal basis of taking "Land Readjustment" project under the provisions of T1 Act? (20)
- (c) What are the purposes of T1 Act 1953? (5)
- (d) What kind of permission is required to establish a Fuel Station that is close and connected to a national highway? (5)
6. (a) Briefly explain the provisions of the following matters under the "Building Construction Act 1952". Write in your own language. (25)
- (i) Restriction on construction of Building
- (ii) Restriction on improper land use and Building
- (iii) Direction for removal of construction
- (iv) Restriction on hill cutting
- (v) Direction for stopping cutting/razing of hill.
- (b) Differentiate cognizable and non-cognizable offences with appropriate example from planning. (7)
- (c) Mention the principles of planning laws. (3)
7. (a) Briefly explain the provisions described in "Open Space and Wetland Conservation Act, 2000" to protect openspace and wetland proposed in a master plan. (10)
- (b) Draw a flow chart to explain the land acquisition process under "Acquisition and Requisition of Immovable Property Ordinance, 1982. (15)

PLAN 403

Contd... Q. No. 7

- (c) You are assigned to prepare a layout plan of a private residential area. The project area has a natural water body covering 5% of the total area. After computation you have found that it can accommodate maximum 60,000 population. Estimate (i) total project area (including water body) (ii) total land for internal road (iii) total area for common space (iv) saleable plot area. **(10)**
8. (a) Write the provisions of Real Estate Management Act 2010, **(15)**
- (i) failure of paying "down payment/installment by the buyer of a flat.
 - (ii) failure of "Developer" in hand-over the flat in due time.
- (b) List the offenses mentioned in the Real Estate Management Act 2010. **(10)**
- (c) Briefly write the provisions of design-considerations for community facilities under "Private Residential Land Development Rule, 2004". **(10)**
-