1. (a) What are the objectives of the planning process for a sustainable Water Supply System for a community? Describe
(b) Do you think that Bangladesh is a Water-Scarced country? Give reasons in favour of your answer. What are the constraints and opportunities of shifting groundwater based water supply system to surface water based system in Bangladesh? Describe.
(c) Show that the removal efficiency of a Sedimentation Basin depends on the plan area rather than the depth of the basin.

2. (a) Why is the knowledge of water demand and projection important in planning? Explain with example.
   State the design period adopted in planning process of the following components of a Water Supply System: i) Pipe line ii) Pump iii) Overhead Reservoir
   (b) The population data of a small town in post decades are given below. Estimate the population for year 2030 by the following methods: i) Arithmetic Progression ii) Geometric Progression iii) Incremental Increase and iv) Changing Rate of Increase method.
   Make your comments on the projected population by using those methods.

<table>
<thead>
<tr>
<th>Yr</th>
<th>1980</th>
<th>1990</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>19800</td>
<td>24200</td>
<td>29500</td>
<td>35300</td>
</tr>
</tbody>
</table>

(c) What factors influence the selection of Intake location?

3. (a) You are in a change of a town planning in a coastal town of Bangladesh and you have to plan its Water Supply System. What factors you should consider in planning the system with respect to the source and treatment? Describe in detail.
(b) A rectangular Sedimentation Basin is to treat 53000 ft³/day of raw water. The detention time is 4 hours, the velocity of flow is 3 inch per minute and total depth is 14 ft. If an allowance of 4 ft is allocated for sedimentation, then what should be the length and width of the basin?
(c) Why is slow Sand Filter (SSF) preferred to Rapid Sand Filter (RSF) in water treatment process? Explain.
CE 471

4. (a) Write a short essay on Water Distribution System of Dhaka City. In your opinion, how this system can be improved? State. (13)
   (b) What are the purposes of Wastewater Treatment? How does DWASA treat the domestic sewage of Dhaka City? Describe. (13)
   (c) What factors govern the selection of a disinfectant? Name of commonly used water disinfection method. (9)

SECTION – B

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

5. (a) What is SWM? What approaches you can adopt to reduce the wastes and how? Make a comparison of solid wastes collection methods between your country and a developed country. How can this system be improved? Make suggestions. (7+8)
   (b) What are the primary pollutants responsible for air pollution? Describe their direct and indirect roles in climate change. (5)
   (c) What is the purpose of a Transfer Station (TS). Is there any TS in Dhaka City? Are they effective? Give your opinion. (5)
   (d) Describe the factors which should be considered in physical planning of landfill site and also state their specific siting requirements. (10)

6. (a) A septic tank is to be designed for a family of 12 members. The house has the facility of piped water supply system. Design the specific tank for the family assuming time allowed for sedimentation of settleable solids and desludging interval are 14 hours and 2 years, respectively. Note that only the sanitary sewage will be discharged into the septic tank. The ambient temperature of the area is above 10°C throughout the year. (15)
   (b) Define leachate. Why is it necessary to manage the leachate and how it can be managed? (7)
   (c) Make comparison of basic mechanism of different secondary wastewater treatment processes. Also discuss the applicability of each treatment option. (13)

7. (a) State the merits and demerits of - i) VIP Latrine & ii) pour flash latrine (14)
   (b) Draw a neat diagram showing different stages of wastewater treatment processes. Describe the sanitation situation of Dhaka City. How the sewerage system of Dhaka can be improved with time? (5+8)
   (c) Write short note on composting toilet. (8)
8. (a) Write down the merits of SBS system over conventional sewerage system? Also describe the suitability of SBS system for different areas of Dhaka City. \( (6+5) \)
(b) Define sanitation. What key issues should be considered while planning a sanitation program? Discuss briefly. \( (9) \)
(c) Differentiate between sludge dewatering and sludge thickening. What are the advantages of using a soak pit? \( (5+4) \)
(d) Define sullage, sewerage and sludge. \( (6) \)
1. (a) ‘A Taka today is more valuable than a taka a year ago’ – Explain.  
(b) What is annuity? Mr. Alam plans to send his son for higher studies abroad after 10 years. He expects the cost of these studies to be BDT 1,000,000/-. How much should he save semi-annually to have a sum of 1,000,000/- at the end of 10 years, if the interest rate is 12%?  
(c) At the time of his retirement, Mr. Chowdhury is given a choice between two alternatives:  
   (i) an annual pension of BDT 10,000/- as long as he lives.  
   (ii) a lumpsum amount of BDT 50,000/-.  
   If Mr. Chowdhury expects to live for 15 years and the interest rate is 15%, which option appears more attractive?  
(d) ‘Externalities are not deliberately created by the project sponsor but is an incidental outcome of legitimate economic activity’– Explain.

2. (a) List different techniques of risk analysis. ‘Notwithstanding its appeal and popularity, sensitivity analysis suffers from several shortcoming’ - explain.  
(b) The following net cash flows relate to two projects:  

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Cash Flows (in BDT 1,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

   (i) Calculate the Net Present Value (NPVs) for each project assuming 10% cost of capital.  
   (ii) Assuming that the two projects are independent, would you accept them if the cost of capital is 15%?  
   (iii) What is the Internal Rate of Return (IRR) of each project?  
   (iv) Which of the two projects would you prefer if they are mutually exclusive, given a 15% discount rate?

3. (a) Discuss Consumer Willingness to pay in the context of social cost benefit analysis.  
(b) What are the five stages of appraisal in the UNIDO method as described in the Guide to practical Project Appraisal.

Contd .......... P/2
PLAN 401

Contd ... Q. No. 3

(c) Finix company borrows BDT 500,000/- at an annual interest rate of 14 percent. The loan is to be repaid in four equal annual installments payable at the end of each of the next four years. Prepare the loan amortization schedule. (12)

(d) List the principal sources of discrepancy between social cost and benefit on the one hand and monetary cost and benefit on the other. (4)

(e) What is the basic difference between PERT and CPM? (4)

4. (a) Discuss aspects of time estimation during network analysis. (5)

(b) The normal and crash times and direct costs for the activities of a project are shown below:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time (in Week)</th>
<th>Cost (in BDT)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Normal</td>
<td>Crash</td>
</tr>
<tr>
<td>(1-2)</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>(2-4)</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>(1-3)</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>(3-4)</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>(4-7)</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>(3-5)</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>(4-6)</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>(6-7)</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>(7-9)</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>(5-9)</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>

(i) Draw the network diagram

(ii) Determine all the normal and critical paths.

(iii) Find the minimum cost project schedule if the indirect costs are BDT 1000 per week.

SECTION – B

There are FOUR questions in this Section. Answer any THREE questions.

5. (a) Suppose that a project has been undertaken to address the problem of traffic congestion in Dhaka city. ‘The negative situations of the problem tree are turned into solutions in objective tree’ – Explain this statement considering this problem. (6+6+3=15)

(b) Construct a log-frame matrix for the project considering the some issue mentioned in Q. No. 5(a). For construction of the matrix, consider an activity to solve a single cause nd consequently reduce its effects. (12)

(c) Write down the characteristics of a project. When does a project reach its end? (5+3=8)
PLAN 401

6. (a) In February 2018, Blueberry, a software development company, recognizes the need to undertake an office renovation project to keep the organization functioning. If is also aware about the need of launching a new anti-virus software to maintain advantage in market. Again some software engineers of Blueberry think that a new version of its software BlueCAD should be lunched fixing the bugs of the previous version. Blueberry has limited budget and can undertake only one project. Which project Blueberry is more likely to invest in? Justify your answer.

(b) What is Comparison Group Model? Explain in brief.

c) Suppose a project has been undertaken for developing cyclone preparedness in the coastal districts of Bangladesh. The total budget for this project is Tk. 4.0 billion. Six consultancy firms have submitted their technical and financial proposals for the project. The evaluation committee evaluated their proposals and gave points which are provided in Table 1 and 2. The minimum qualifying marks for technical proposal is 80. The relative weight of quality and cost have been set at 62% and 38% respectively. Explain with proper justification which of the consultancy firms you would select as a procuring entity on the basis of the following methods:

(i) Quality and Cost Based Selection (QCBS)
(ii) Selection under Fixed Budget (SFB)
(iii) Least Cost Selection (LCS)

\[(10+4+8+8+5=21)\]

![Table 1: Evaluation of Technical Proposals](image)

<table>
<thead>
<tr>
<th>Consultancy Firm</th>
<th>Specific Experience</th>
<th>Adequacy of Methodology and Work</th>
<th>Key Staff Qualification</th>
<th>Transfer of Knowledge</th>
<th>National Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5</td>
<td>30</td>
<td>45</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
<td>22</td>
<td>42</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>27</td>
<td>52</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>7</td>
<td>31</td>
<td>40</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>6</td>
<td>20</td>
<td>41</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>F</td>
<td>4</td>
<td>38</td>
<td>40</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

![Table 2: Evaluation of Financial Proposals](image)

<table>
<thead>
<tr>
<th>Consultancy Firm</th>
<th>Budget (in billion Tk.)</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.5</td>
<td>70</td>
</tr>
<tr>
<td>B</td>
<td>3.8</td>
<td>85</td>
</tr>
<tr>
<td>C</td>
<td>3.7</td>
<td>88</td>
</tr>
<tr>
<td>D</td>
<td>3.2</td>
<td>100</td>
</tr>
<tr>
<td>E</td>
<td>4.0</td>
<td>80</td>
</tr>
<tr>
<td>F</td>
<td>3.5</td>
<td>92</td>
</tr>
</tbody>
</table>
PLAN 401

7. (a) Describe in brief the basic project management functions. (16)
    (b) Write down the purpose of project monitoring, evaluation and audit. (5+5+3=13)
    (c) Do you think project and routine work are the same? Justify your answer. (6)

8. (a) Explain in brief with appropriate example the type of development projects undertaken in Bangladesh. (12)
    (b) What do you understand by ‘Means’ and ‘Costs’ in project planning? (3)
    (c) What is EOI? What should an EOI request contain? (3+5=8)
    (d) Define policy, plan, program and project. Draft Dhaka Structure Plan 2016-2035 identifies a long term policy framework of providing better public facilities. Develop one plan, one program and two projects that can contribute in achieving these policies. (4+8=12)
SECTION – A
There are FOUR questions in this Section. Answer any THREE.

1. (a) There are ten different concepts of justice and three different approaches for making laws. Do you think there are relationships among them? Justify and explain your answer. (25)
   (b) Give an example when the court rulings or verdict is accepted or rejected or reframed ‘legitimate expectations’ of the case petitioner. (10)

2. (a) There are many plans for urban land use, transport, environment, etc. If those plans are implemented, condition of cities would have much improved. Yet there are many planning laws. Explain – why? (10)
   (b) What is right based approach in planning? Give two examples. (10)
   (c) What are the local and international (applicable to all) sources of rights? What rights do they recognize? (10)
   (d) Why ‘procedural fairness’ is required even to do a right thing? (5)

3. (a) Do you think there is relationship between planning approaches (normative and participatory) and origin of laws? Justify your answer. (18)
   (b) What is the legal implication –
      - if a water body is not identified as water body in any urban development plan.
      - if a plan is not gazetted.
   (c) If someone claims that he has taken permission from the conservator of port to construct shops on the bank of a river, will his claim be legally defendable? Justify your answer. (7)

4. (a) List out the documents required for land registration. (10)
   (b) Define ‘khas land’ and ‘mutation’. (8)
   (c) Why the earliest land survey done in Bangladesh is still important? (5)
   (d) “Modern facilitation, ‘development’ are not always legally welcome”. Justify the statement with respect to court case against conversion of Laldighi, Chittagong into a ‘modern’ swimming pool. (12)
PLAN 403

SECTION – B

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

5. (a) Differentiate the terms ‘Act’, ‘Rules’ and ‘Ordinance’.
    (b) Identify the major public Agencies involved in the urban development and management in Dhaka city and show their vertical and horizontal relationship with the ministries and other departments.
    (c) Write the major functions of RAJKUK, Urban Development Directorate, Public Works Department, LGED, Dhaka Transport Coordination Authority, National Housing Authority and City Corporations.

6. (a) What was meant by the terms “Natural wetland” and “Class change” of land use in “Open Space and Wetland Conservation Act 2000”?
    (b) Explain the procedure of land use “class change” described in the Open Space and Wetland Conservation Act 2000.
    (c) Mention the name of Standing Committees for performing the functions of City Corporation.

7. (a) Write in your words on the following matters in the light of “Mohanagar Imarat Nirman Bidhimala 2008”.
    (i) Functions of land use clearance in urban planning.
    (ii) Categories of large projects need to take special development permit.
    (iii) Occupancy certificate and plan violation.
    (b) Briefly write the matters to be considered and not be considered in the land acquisition process as per the “Acquisition and Requisition of Immovable Property Act 2017”.

8. (a) What are the purposes and jurisdiction area of Town Improvement (TI) Act 1953?
    (b) Under what circumstances an Authorized Officer takes initiatives to remove or dismantle a building under “Building Construction Act 1952”?
    (c) Briefly state the provisions of design – considerations for community facilities under “Private Residential Land Development Rules 2004”.

------------------------------------------------------------------
L-4/T-1/URP

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA
L-4/T-1 BURP. Examinations 2017-2018
Sub: PLAN 451 (Environmental Planning and Management)

Full Marks: 210 Time: 3 Hours

The figures in the margin indicate full marks.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

There are FOUR questions in this Section. Answer any THREE.

1. (a) What do you understand by ‘ecosystem’? Describe with examples the difficult types of ecosystem. (6+9=15)
   (b) Define population habitat, community, niche and organisms. (4×5=20)

2. (a) What is ‘biotic’ and ‘abiotic’ environment? Discuss the relationship between them with example. (8+7=15)
   (b) Demonstrate with example the natural and man-made environment. (10)
   (c) Write down the multiple goals of sustainable development. (10)

3. Explain in detail the causes, effects and plausible solutions of any three types of environmental problems in Bangladesh. (35)

4. Write short notes on the following topics: (35)
   (a) Deforestation and ozone depletion
   (b) Global environmental problems
   (c) Abiotic components.

SECTION – B

There are FOUR questions in this Section. Answer any THREE questions.

Abbreviation and Terms have their usual meaning.

5. (a) “Environmental issues cover wide range of academic disciplines” – explain with example. (5)
   (b) Explain with examples the four types of strategies that could be taken to mitigate the impact of development. (8)
   (c) Legislation of the land decides the screening and scoping of an EIA – Explain. (6)
   (d) “Every tools for impact identification has its advantages and disadvantage”. Considering this, what are the conditions one have to taken into account for choosing a particular tool. (11)
   (e) “EIS is a comparative document” – Justify. (5)

Contd ........ P/2
6. You are working as an Assistant town planner at RAJUK.
   (a) RAJUK decided to introduce “Bio-topo Area Factor” in its planning permission process. Before introducing it, RAJUK wants to check whether it would integrate environmental issues in Bangladesh context. You are in the team who would test the viability of introduction of bio-topo. What are the tools you have to test whether Bio-topo area factor could integrate environment in Bangladesh context.
   (b) The Chief Town Planner assigned you to develop a guideline for Fecal sludge Management (FSM). What are the challenges you could identify for FSM in Dhaka?
   (c) RAJUK wants to promote urban agriculture in its new planner can you identify the spaces that are suitable for urban agriculture.

7. (a) “Though both EIA and SEA study the impact of development on environment their perspectives are different” – do you agree? Justify your answer by highlighting the similarities and differences between then.
   (b) “Leopold Matrix, though used for impact identification, can also be used for impact prediction” – do you agree? Justify your answer.
   (c) What is watershed management? Describe the different strategies for watershed management citing examples from Dhaka Metropolitan Development Plan (DMDP) 1996-2015.

8. Write short notes on (Any Five)
   (a) Pollution Standard Index
   (b) Environmental Baseline
   (c) Ideal Monitoring System
   (d) Biological Analysis for Eco-planning
   (e) Risk Analysis for land use plan
   (f) Initial Environmental Examination.