BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   BURP Examinations 2014-2015

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 – A

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

1. (a) Explain with examples why routine work is different from a project work. **(8)**

   (b) Which is the make or break stage for the project implementation decision? What dimensions are considered in this stage? **(12)**

   (c) Suppose a community improvement project is to be undertaken in Lalbag thana of Dhaka city. Which criteria you would select as a project manager to analyze the stakeholders and how will this analysis help you understand the community problem? **(15)**

2. (a) What is a concept note? Why is it important? **(5)**

   (b) Describe different categories of evaluation based on when the evaluation is conducted in a project life cycle. **(7)**

   (c) "A good evaluation system is governed by some principles" – what are these principles? **(8)**

   (d) A project has been carried out to reduce the frequency of bus accidents from 2010 to 2015. Two activities such as training of bus drivers and replacement of old vehicles have been undertaken by the project team. As a monitoring and evaluation committee member, construct a $2'' \times 6''$ M&E matrix based on these two solutions. **(15)**

3. (a) "Although monitoring and evaluation are often used synonymously, they are significantly different" – explain. **(12)**

   (b) If the work progress of different projects is graphed, it can reveal two shapes. Why do these shapes take place? **(8)**

   (c) Objective analysis by objective tree is actually a 'means-end analysis' – justify the statement with an example. **(8)**

   (d) Briefly explain the commonly used models of evaluation. **(7)**

4. (a) What is pareto improvement allocation? Do you agree that the sets of allocation within pareto improvement are pareto optimal allocation? – explain your opinion with a diagram. **(6)**

   (b) Assume there are only two people – X and Y – in the economy. X produces only food and y produces only clothing. There are a fixed amount of only two resources to produce these items – capital and labour. Based on this scenario, derive a production possibility frontier from pareto optimal allocation of these resources. **(10)**

PLAN 401

Contd ... Q. No. 4

(c) Briefly describe the sequential process of request for proposal method. Why is it different from open tendering? **(10+4=14)**

(d) When do you think two-stage tendering is more suitable method of procurement? Why is it called "two-stage"? **(5)**

SECTION – B

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

5. (a) Compare "Internal Rate of Return" with "Accounting Rate of Return". Explain the disadvantages of Accounting Rate of Return in determining the feasibility of a project. **(6+14=20)**

(b) The social costs and benefits of a project may be different from its monetary costs and benefits due to several factors. What are these factors and how they influence the costs and benefits of a project? **(15)**

6. (a) The table below shows the time estimates for the activities that constitute the critical path of a project network.

Activity	Duration (weeks)		
	Optimistic	Most Likely	Pessimistic
A	22	25	29
B	12	17	21
C	9	14	16
D	30	34	36
E	29	34	40

(i) Calculate the mean time required for completing the project. **(10)**

(ii) What is the probability of completing the project in 124 weeks? **(10)**

(b) Two competitive projects have the following cash flows over their project life. Using the concept of discounted payback period, determine which project is more feasible at a discount rate of 11%. **(15)**

Year	Project A (BDT)	Project B (BDT)
0	(220,000)	(280,000)
1	20,000	95,000
2	10,000	90,000
3	56,000	65,000
4	96,000	30,000
5	90,000	58,000
6	85,000	20,000
7	35,000	15,000
8	20,000	14,000
9	18,000	10,000

PLAN 401

7. (a) A company is considering to start a new project. To determine associated risks, the company is conducting a break-even analysis based on the previous data of similar projects. Using the following information determine the financial break-even point of the project income. **(20)**

- Initial Investment   = Tk. 17 million
- Variable cost   = Tk. 12 million
- Income   = Tk. 18 million
- Fixed cost   = Tk. 1 million
- Depreciation   = Tk. 1.5 million
- Tax   = 25%
- Project life   = 10 years
- Interest Rate   = 12%

(b) Explain how shadow prices are determined for labour inputs considering the impacts on the rest of the economy. **(15)**

8. (a) A finance company announces that it provides 10% interest on investment at an interval of three months.

(i) What is the effective interest rate provided by the finance company? **(5)**

(ii) If an investor deposits 20,000 at the end of each year, what will be the total amount after 10 years at this effective interest rate? **(5)**

(b) With relevant examples, explain the sources of shadow prices in a economy. **(15)**

(c) What are the different sources of risk for a project? **(10)**

Cumulative Probability up to Z for Standard Normal Distribution

Z	Cumulative probability
− 3.0	0.001
− 2.8	0.003
− 2.6	0.005
− 2.4	0.008
− 2.2	0.014
− 2.0	0.023
− 1.8	0.036
− 1.6	0.055
− 1.4	0.081
− 1.2	0.115
− 1.0	0.159
− 0.8	0.212
− 0.6	0.274
− 0.4	0.345
− 0.2	0.421
0.0	0.500
0.2	0.579
0.4	0.655
0.6	0.726
0.8	0.788
1.0	0.841
1.2	0.885
1.4	0.919
1.6	0.945
1.8	0.964
2.0	0.977
2.2	0.986
2.4	0.992
2.6	0.995
2.8	0.997
3.0	0.999

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   BURP Examinations 2014-2015

Sub : **PLAN 403** (Legal Basis of Planning)

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**.

All terms and acronyms have their usual definition and meaning unless otherwise mentioned.

1. (a) Describe the procedure of land acquisition in Bangladesh according to the "Acquisition and Requisition of Immovable Property Ordinance, 1982". **(20)**

   (b) Draw a hierarchical diagram illustrating the name and major functions of the authorities responsible for land administration of Bangladesh. **(8)**

   (c) If ground area of any plot is 2400 sq.m., the ratio of length to width is 3 : 2, set back from each side of the plot boundary is 3 meter and the building is 6 storied, calculate FAR of that building. **(7)**

2. (a) Discuss the issues to be considered while providing pedestrian walkways according to the Bangladesh National Building Code (BNBC), 2006. **(10)**

   (d) Describe the responsibilities vested on Pourashava to enhance public health and education, according to the Local Government Pourashava Act, 2009. **(14)**

   (c) What is the procedure of changing land uses of open space, playground, garden, and wetland mentioned under the "Open Space and Wetland Conservation Act, 2000"? **(6)**

   (d) Mention the responsibilities that a seller needs to fulfill before handing over the sold land. **(5)**

3. (a) Define the following terms: **(3×5=15)**

       (i) Fire Resistance Rating (According to BNBC, 2006)

       (ii) Combustible material (According to BNBC, 2006)

       (iii) Height of Building (According to Building Construction Rule, 2008)

       (iv) Land use change (According to Open Space and Wetland Preservation Act, 2000)

       (v) Diara (According to land laws of Bangladesh)

   (b) What are the restrictions imposed on construction and improper use of buildings under the "Building Construction Act, 1952"? **(8)**

   (c) Mention the criteria of the projects those require development permit before construction. **(6)**

   (d) Define mutation. Write down the process of certifying mutation. **(6)**

PLAN 403

4. (a) Briefly describe the key developments in land policy and administration of Bangladesh during Pakistan period. **(10)**

(b) State the rules regarding land use, maximum land for sate, land ownership and rehabilitation of affected people which must be followed while developing any private residential housing scheme. **(10)**

(c) The figure below illustrates two buildings constructed on a single plot. Both of these buildings are 15 meter high (5 storied) and used for residential (A_1) purpose. Answer the following questions with justifications:

(i) What should be the minimum width of front, side and rear open spaces for building 01? **(10)**

(ii) What is the minimum number of parking spaces that should be provided in building 02? **(5)**

** All dimensions are in meters.

** If necessary, use the following able.

** All calculations musy follow the codes of BNBC, 2006

SECTION – B

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

5. (a) What is the difference between understanding legal basis of planning and knowing planning laws? **(8)**

(b) Briefly discuss the evolution of planning laws. **(10)**

(c) What are the importance of law in general? **(7)**

(d) Define any four of the land records and documentation related terms: 'Mouza', 'Baina Nama', 'Power of Attorney', 'Aeoj Bodol', 'Null Jómi', and 'Will'. **(10)**

6. (a) Differentiate among formal Equity, Equity of Final Outcome and Procedural Fairness. Do you think that consideration of these issues will make plans and planning different? Briefly discuss with examples of different planning interventions in Dhaka and Bangladesh. **(18)**

(b) What is Right Based Approach in planning? **(7)**

(c) Differentiate between positivist and socio-historical approaches of law making with relevant examples. **(10)**

PLAN 403

7. (a) There are several court cases against encroachment of city lakes at Gulshan, Baridhara and Uttara areas and creation of new plots violating original layout. Briefly discuss the logic and legal points acknowledged and accepted by the honorable court while delivering judgment in these cases. **(12)**

(b) What are the sources of Khas Land? **(8)**

(c) What is the implication of Declaration of Fundamental Human Rights, 1948 for urban and regional planning and its allied professional domain? **(8)**

(d) What is the importance of any plan as a legal document? **(7)**

8. (a) "Public Interest Litigation does not only involve judges and lawyers. Subject specific experts and their expertise play a significant role for success of the litigation in holding public interest". Do you agree with the statement? Justify your answer with respect to public interest litigations in Bangladesh having planning and environmental concerns. **(13)**

(b) What are the points based on which both the High Court and the Supreme Court declared construction of BGMEA building illegal and ordered for the demolition of it? **(22)**

Occupancy	Plot Size (m²)	Minimum Rear Open Space (m)	Minimum Side Open Space (m)
Residential (Not higher than 10 storeys or 33 m)	Not over 135	1.25	Nil
	Over 135 to 200	1.5	1.25
	Over 200 to 265	1.75	1.25
	Over 265 to 330	2.5	1.25
See Note below	Over 330 to 660	3.0	1.25
	Over 660	4.0	1.25
Residential (Higher than 10 storeys or 33 m)	Any	4.0	3.0
Business and Mercantile (Not higher than 10 storeys or 33 m)	Any	1.5	1.5
Business and Mercantile (Higher than 10 storeys or 33 m)	Any	2.0	2.0
Educational, Institutional, Health Care, Assembly, Industrial, Storage and Hazardous.	Any	3.0	3.0

Note : For residential buildings not higher than 10 storeys or 33 m, if the rear property line of the plot is curved or not a continuous straight line or not parallel with the building, the minimum rear open space requirement shall apply to the average distance of the rear property line from the building, but at no point shall the distance be less than 1.25 m.
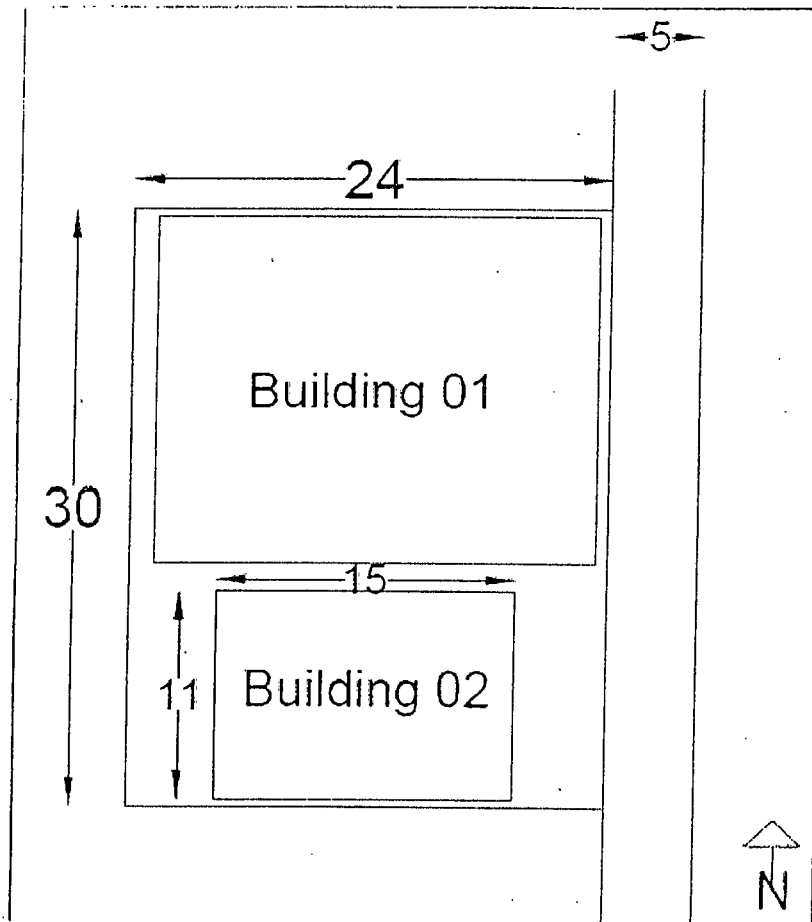

Figure for Question No. 4(c)

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   BURP Examinations 2014-2015

Sub : **CE 471** (Basic Environmental Engineering)

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) As a planner, how can you apply the knowledge of Environmental Engineering in your professional field? Explain with examples.   **(8+12)**

   What factors should be considered in planning of a Water Supply Scheme in a small town and what are the implications of those factors? Describe in detail.

   (b) The population data for a small town is given below. Determine the probable population for the year 2040 by Geometric Progression method.   **(9+6)**

Year	1980	1990	2000	2010	2020
Population	20,000	24,300	28,200	32,500	36,700

   Describe the variations of rate of water consumptions and its implication on design of water supply system.

2. (a) What are the advantages and disadvantages of using Rain water over Ground water and Surface water? Describe.   **(8+5+5)**

   With a neat sketch show the different elements of a rainwater collection system. What factors should be considered in selecting the rain water as a water source?

   (b) With a flow diagram show the commonly used water treatment methods.   **(9+3+5)**

   Describe the mechanisms of Coagulation Process.

   What is 'Schmutzdecke'? What is it's role in filtration process? Explain.

   A rapid sand filter bed has an area of 350 sft and it needs washing at the rate of 15 gpm per sft for 7 mins. The time required for resettlement of sand is 12 mins. What percentage of filtered water will be required for wash water? Assume the filtration rate of RSF is 2 gpm/sft and washing is done after every 24 hrs of operation.

3. (a) Why is Water Distribution System called a collective system?   **(2+5+11)**

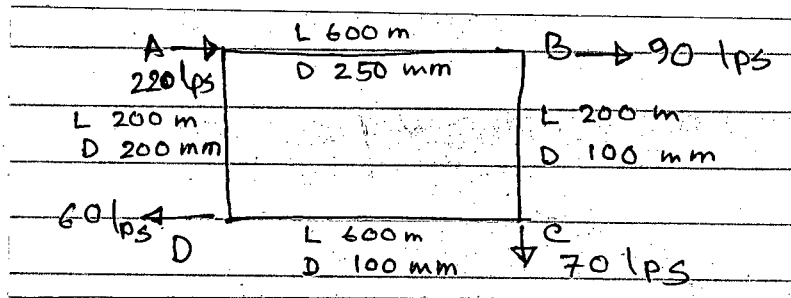   Describe the suitability of various water distribution network systems.

   State the assumptions in analysis of distribution network by Hardy Cross method. (Nomograph attached).

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Contd ... Q. No. 3

Determine the approximate flow in the pipes in the network shown below.

(b) Do you think groundwater is a sustainable water source for Bangladesh? Justify your answer. **(5+8+4)**

How do you select a good disinfectant? With a neat sketch, show the different zones of Chlorination process.

What factors should be considered in designing the Water Distribution System?

4. (a) What are the reasons of low sanitation coverage in Bangladesh? How can you improve the situation? Describe. **(7+3+8)**

What is the basic improvement made in the Pour-flush technology compared to Simple Pit and VIP technologies?

Design a Pour-flush latrine for a family of 7 with design life 3 years. The wastewater flow rate is 12 lcd and infiltration rate of soil is 20 l/m^2 day. (Assume any reasonable value of missing data, if necessary).

(b) Differentiate between Conventional Sewerage System and Small Bore Sewerage System. Why is conventional system not suitable for a developing country like Bangladesh? Explain. Describe the sewerage system of Dhaka city. **(7+3+7)**

SECTION – B

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

5. (a) (i) What is waste management hierarchy? How can you achieve that? Describe in detail
(ii) Differentiate between Municipal solid waste (MSW) and Hazardous waste with examples. **(8+2+3+5=18)**
(iii) How can legislation influence the generation of solid waste? Give an example of this in Bangladesh's perspective.
(iv) Describe the various solid waste collection systems.

(b) (i) What factors are responsible for inefficient collection and transportation of solid waste? **(5+5+7=17)**
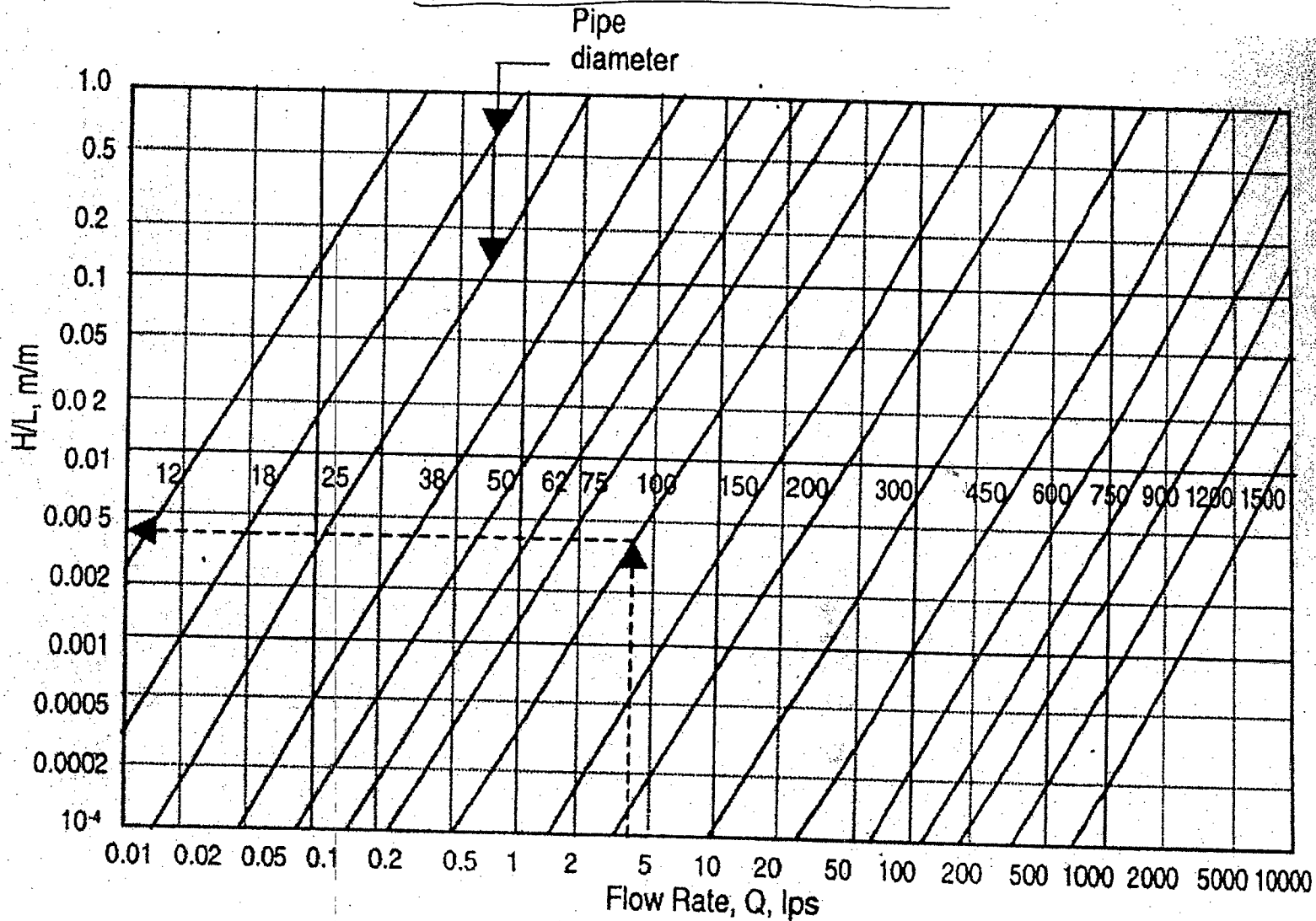(ii) What is the role of transfer station in SWM system? Is there any transfer station in Dhaka city?
(iii) How do you rate the SWM system of Dhaka city? What are your suggestions to improve the system?

CE 471/URP

6. (a) (i) What factors should be considered in planning and sitting of a sanitary landfill? Describe in detail. **(10+4+4=18)**

   (ii) State the different solid waste processing technologies.

   (iii) How can you convert solid waste into resources? Give two examples.

   (b) (i) With a flow diagram, describe the basic processes of aerobic composting?

   (ii) What parameters should be considered for efficient composting process? **(9+4+4=17)**

   (iii) Discuss potential of composting in Bangladesh. What are the constraints in promoting composting in Bangladesh?

7. (a) (i) Define air pollution. Name the pollutants and their sources which play major role in air pollution. **(10+4+4=18)**

   (ii) List some actions which an individual can take to reduce air pollution?

   (iii) What is photochemical SMOG? Describe its effects.

   (b) (i) How does ozone layer depletion occur? Explain with chemical reactions.

   (ii) What measures are taken to reduce ozone layer depletion? Describe. **(5+5+7=17)**

   (iii) Name the greenhouse gases. State the effects of global warming on agriculture.

8. (a) (i) What is the difference between sound and noise?

   (ii) Describe the various sources of noise pollution. **(3+4+10=17)**

   (iii) A train whistle noise level was measured with a noise meter, as being 70 dB at 80 m distance. What would be the sound level at 500 m from the train?

   (b) (i) What are the effects of noise pollution on human and other terrestrial and aquatic lives? Describe. **(10+4+4=18)**

   (ii) State the different measures to control noise pollution.

   (iii) Define the following terms:

   Equivalent sound level (L_{eq});

   Sound pressure level (SPL).

Nomograph for Q.3a

Head loss determination diagram (for C = 120)

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   B. Urp. Examinations 2014-2016

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** questions.

1. (a) Explain the relationship among carrying capacity, ecological footprint and sustainability. **(15)**

    (b) How do you think concept of prisoners' dilemma is related to environmental planning and management? Discuss with appropriate example. **(10)**

    (c) Differentiate between the following- **(5×2=10)**

    (i) EIA and IEE,

    (ii) Public and common Pool Resource.

2. (a) The fertilizer factories of Luthorcorp are disposing 370 cubic tons of effluents, in the river of Smallville for past 15 years. All of the government officials are ignoring the issue saying the disposed effluents are not harmful. This year Clark Kent along with his friend managed to collect a sample of the river water to perform a test by themselves at a secret laboratory. The pollution statistics and weight factors of water quality parameter are provided, along with an example to determine Q value, graphs to determine the Q value for each of the parameters have also been provided. Find the water quality index value for Smallville river. Using the following formula. See if the water is actually harmful.

$$WQI_A = \sum_{i=1}^{n} q_i W_i$$

and interpret the result for Clark Kent. **(25)**

Table: The pollution statistics and weight factors of water quality parameter for sample

Parameters	Weight Factor	Units	Test Result	Q value
DO % Sat	0.18	%	95	?
pH	0.12	pH units	8	80
E. coli	0.17	CFU/100 mL	1750	?
Temp	0.11	Δ deg C	0	?
Turbidity	0.09	NTU	10	?
T Phos	0.11	mg/L P	NM	?
NO3	0.10	mg/L N	0.4	?
BOD	0.12	mg/L	6	?

PLAN 451

Contd ... Q. No. 2

(b) Define the following with examples (If needed) (Any two) (2×5=10)

   (i) Tragedy of Commons

   (ii) Environmental Impact Statement

   (iii) Environmental Inventory.

3. (a) Differentiate between "Screening" and "Scoping" in an EIA process. Describe two mechanisms through which scoping can be done. (4+6=10)

   (b) What are the issues that should be considered while predicting the impacts? Describe briefly. (15)

   (c) Discuss the ways of evaluating the impacts predicted. (10)

4. (a) Do you think environmental management should be a major concern in Bangladesh? Explain your reasoning. (10)

   (b) Describe the sources and impacts of air pollution in our lives. (5+15=20)

   (c) State the techniques of recycling in 3R model. (5)

SECTION – B

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

The abbreviated terms have their usual meanings.

5. (a) 'Environmental problems vary from city to city region to region' – explain the factors responsible for the variations. (16)

   (b) Explain 'Brown' and 'Green' agenda of urban environmental management with example. How as an urban planner you could integrate the agendas in urban planning? (3+3+8)

   (c) Why do you think it is necessary to conduct Strategic Environmental Assessment (SEA)? (5)

6. (a) Write short notes on (Any two) (2×10=20)

   (i) Global policies on sustainable development

   (ii) Environmental critical issues

   (iii) Environmental value system

   (b) What is watershed management? Describe the components of watershed management. Explain the different types of watershed management strategies with example. (3+4+8)

PLAN 451

7. Government of Bangladesh has decided to prepare a sustainable urban development policy. You have been selected as a member of the team that would prepare the policy.

(a) Explain the components of sustainable development that have to be considered in the policy. **(14)**

(b) Describe the issues you have to consider with regards to urban environment taking into account the national strategy for sustainable development of Bangladesh. **(6)**

(c) If you are ask to perform an SEA of the policy, briefly describe the methods you would follow.

8. (a) You are working as an Assistant Town Planner of RAJUK

(a) RAJUK has decided to introduce "Biotope Area Factor (BAF)" in its plan permission process. What are the process tools you could use? **(6)**

(b) Assume that RAJUK has introduced BAF for granting planning permission to any development. RAJUK develop the following parameters for BAF (Table 1 and 2)

Table 1: Weighting factors for surface

Type of surface	Weighting factor (per m^2 of space)
Sealed Surface	0.0
Partially Sealed Surface	0.3
Semi open Surface	0.5
Surface with vegetation (connected to soil)	1.0
Surface with vegetation (Not connected to soil)	0.7
Roof top vegetation (with more than 80 cm soil)	0.8
Roof top vegetation (with less than 80 cm soil)	0.6

Table 2: BAF value for land use

Land Use Type	BAF value for granting permission	BAF value for conditional permission
Residential Development	0.6	0.5
Commercial Development	0.4	0.35
Mixed Development	0.5	0.4
Industrial Development	0.3	0.25

You received an application for a mixed development with following information.

Table 3: Surface Area of Development

Type of Surface	Area
Sealed Surface	1300m^2
Semi open Surface	800m^2
Partially Sealed Surface	1000m^2
Surface with vegetation (Not connected to soil)	800m^2
Surface with vegetation (connected to soil)	1000m^2

(i) Would you grant a planning permission on the basis of BAF for the development? **(2)**

(ii) What would be your suggestion to developer, if you issue a conditional permit? **(3)**

PLAN 451

(c) You have been asked to assist chief town planner to develop a framework that would encourage urban agriculture,

(i) Write down the challenges that RAJUK and citizens of Dhaka would face for promoting urban agriculture. **(12)**

(ii) Identify the spaces that are presently in other uses that could be promoted for use in urban agriculture by RAJUK. **(12)**

Graphs for Q-value for water quality parameters

Chart 1: pH — pH Note: If < 2.0 or > 12.0, Q = 0.0

Chart 2: Dissolved Oxygen — DO% saturation Note: If > 140.0, Q = 50.0

Chart 3: 5-Day Biochemical Oxygen Demand (BOD₅) — BOD₅ (mg/L) Note: If > 30.0, Q = 2.0

Chart 4: Fecal Coliform — FC (Colonies per 100 ml) Note: If > 100,000, Q = 2.0

Chart 5: Total Phosphate (as PO₄-P) — PO₄-P (mg/L) Note: If > 10.0, Q = 2.0

Chart 6: Nitrate (as NO₃) — NO₃ (mg/L) Note: If > 100.0, Q = 1.0

Chart 7: Change in Temperature (°C) — ΔT (°C)

Chart 8: Total Dissolved Solids (TDS) — TDS (mg/L) Note: If > 500.0, Q = 20.0

Chart 9: Turbidity (NTU) — Turbidity (NTU) Note: If > 100.0, Q = 5.0