BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1 BURP Examinations 2010-2011

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) Draw a schematic diagram of EIA process.   **(10)**

    (b) Express through a schematic diagram the environmental components of spatial and temporal dimensions to establish environmental baseline.   **(06)**

    (c) Describe the difference between ECC issuance process of Amber A and Amber B category project?   **(10)**

    (d) State the differences between FONSI project and Red category project.   **(09)**

2. (a) Discuss the most widely used Network method for Environmental Impact Identification.   **(10)**

    (b) What is Environmental Evaluation System (EES)? How it works to produce a composite index through comparing the relative importance of all environmental impacts?   **(03+07=10)**

    (c) Distinguish various types of Checklist as Impact Identification method.   **(15)**

3. (a) Find out the significance of Tragedy of commons and Prisoner's Dilemma concepts to define the accepted ways of viewing many problems that individual face when attemting to achieve collective benefits.   **(13)**

    (b) Is there any difference between Public goods and Common Pool Resource?   **(05)**

    (c) What are the standard and quality indices for measuring air and water pollution?   **(12)**

    (d) Name the major pollutants according to EPA (Environmental Protection Act.)   **(05)**

4. (a) What are the major areas of environmental concern for Bangladesh? How urbanization is linked with climatic and environmental change.   **(06+04=10)**

    (b) Define major characteristics of hazardous waste. Discuss 3R Model of waste management.   **(05+10=15)**

    (c) Which projects face NIMBY? Give Example. Discuss the five stages of SEA (Strategic Environmental Assessment) Process.   **(03+07=10)**

PLAN 451

SECTION – B

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

5. (a) What do you mean by environmental management? What are the specific tasks of environmental management? **(5)**

(b) Write down the causes of environmental degradation in Bangladesh. **(5)**

(c) List the environmental issues of atmosphere, hydrosphere and lithosphere. **(10)**

(d) Show by a flow diagram the different types of environment. **(5)**

(e) Write short notes on abiotic and biotic environment. **(10)**

6. (a) Write down the concept of "sustainable development". Explain the multiple goals applied to cities that contribute to sustainable development. **(20)**

(b) Write short notes on (i) habitat, (ii) acid rain, (iii) green house effect, (iv) Ozone layer depletion, and (v) food web. **(15)**

7. (a) What are the physical and chemical factors that exert an influence on living organisms? **(6)**

(b) Distinguish among ecological system, ecosphere, population, and natural community, and give an example of each. **(12)**

(c) Describe the major components of all ecosystems. **(11)**

(d) Draw with neat diagrams of the structure of a forest ecosystem and a freshwater pond ecosystem. **(6)**

8. Briefly explain the causes, effects and some solutions of <u>any five</u> of the following problems in Bangladesh: **(7×5=35)**

      (a) Air pollution,

      (b) Global warming,

      (c) Noise pollution,

      (d) Land pollution,

      (e) Hazardous waste,

      (f) Water pollution, and

      (g) Forest destruction.

L-4/T-1/B.URP   **Date : 01/02/2012**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   B.URP. Examinations 2009-2010

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 **THEEE.**

1. (a) Name the maps essential for a Master Plan. Discuss about the deficiencies of 1974 Development Planning system according to UK Town Planning laws. ?   **(5+7=12)**

   (b) What are the functions of Local Plan?   **(8)**

   (c) Discuss the procedure of payment and assessment of "Betterment fee" by RAJUK according to the Town Improvement Act (TIA), 1953.   **(15)**

2. (a) According to UK Town and Country Planning Act 1971, discuss different aspects of the Development Plan. ?   **(15)**

   (b) What are the major proposals of DMDP Urban Area Plan (1995-2005) for SPZ?   **(20)**

3. (a) Distinguish between Master Plan System and Structure Plan System according to UK Town Planning laws.   **(10)**

   (b) What do you know about sequential steps of land acquisition in Bangladesh for development works? Discuss with appropriate diagram.   **(13)**

   (c) Define Development. What are the categories of development?   **(5)**

   (d) Name the regulations and acts under special forms of Development Control.   **(7)**

4. (a) Discuss Public Health Legislation under the UK Planning Law.   **(12)**

   (b) Define Legislation, Act and Regulation. Discuss Linear City and Garden City movement under UK planning laws.   **(6+12=18)**

   (c) What is the growth strategy stated in DMDP Structure Plan (1995-2015)?   **(5)**

SECTION – B

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

5. (a) DCC has initiated a project for low income housing and applied to the District Commissioner for acquisition of 45 standard Bigha land. Write in short the process of land acquisition as per "Acquisition and Requisition of Immovable Property Ordinance 1982."   **(14)**

PLAN 403

(b) Write the "matters to be considered" and "matters not to be considered" in determining compensation for land acquisition. **(14)**

(c) Define the terms "Act", "Ordinance" and "Rules" with appropriate examples. **(7)**

6. (a) Name the approval authority and its composition of "Large and specialized project". Which projects are considered as "Large and specialized project" as per Mohanagar Imarat Nirman Bidhimala 2008? **(12)**

(b) Write the concept of FAR with necessary sketch. A land owner of a 3600 sqft plot wants to construct a residential building. Initially he will construct only 3 floors using maximum ground coverage of 55%. How much floor space still he can construct above this building? [Here for this particular plot FAR is 3.25]. **(15)**

(c) Mention the documents need to attach while applying for "building permit" from RAJUK. ? **(8)**

7. Write, in brief, on the provisions of following matters lay down in "Local Government ACT (Pourashava) 2009".

(i) 15 major sources of revenue of a pourashava as you consider most potential for a pourashava. **(15)**

(ii) Town Planning and Land Development project. **(10)**

(iii) Building Construction, reconstruction and building control. **(10)**

8. (a) Write the major objectives of "Building Construction Act, 1952". **(5)**

(b) A land owner got a sanction of constructing a residential building of 6 floors. Afterwards, he constructed an extra floor at the top and rented to a business man for "Roof top restaurant". List the offences he made and provide legal explanation as per "Building Construction Act 1952". **(15)**

(c) How does the "Private Residential Land Development Rules 2004" can contribute in protecting the interests of a buyer? Write the provisions of design-consideration in preparing Lay-out plan for common facilities of a private residential area as per PRLDR 2004. **(15)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   BURP Examinations 2011-2012

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

Full Marks : 210   Time : 3 Hours

The figures in the margin indicate full marks. Acronyms have their usual meaning.

USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A

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

1. (a) How does stakeholder analysis help to understand a problem in project management? **(10)**

   (b) 'Objective tree is the mirror image of problem tree' - Explain. **(8)**

   (c) Describe the structure of a typical Log Frame Matrix. **(17)**

2. (a) State the characteristics of good policy. **(12)**

   (d) Discuss the 'principles of evaluation' in project management. Explain the common models used for evaluation. **(8+8=16)**

   (c) How utility possibility curve can be derived from Pareto optimal allocations of a two person-two commodity economy? **(7)**

3. (a) How do monitoring and evaluation systems fit within a project system? **(10)**

   (b) 'Projects are cyclic and almost every project generates ideas for new project' - Elaborate the statement based on the stages involved in a typical project cycle. **(15)**

   (c) Explain the 'Two Stage Tendering' method of PPA 2003. **(10)**

4. (a) Differentiate between the two terms: 'Pareto Optimality' and 'Pareto Improvement'. **(8)**

   (b) Explain the basic project management functions. **(12)**

   (c) Though project and program complement each other but they are different' - Explain. **(15)**

SECTION – B

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

5. (a) "Finances are important, but they are not everything for a successful project" - Explain the above statement. **(8)**

   (b) A Canadian company is negotiating with the Bangladesh government for the right to mine 150,000 tons of iron ore per year for 20 years. The current price per ton of iron is Tk. 2,950 and it is expected to increase at the rate of 7.5 percent per year. What is the present value of iron ore that the Canadian company can mine if the discount rate is 14 percent? **(12)**

PLAN 401

Contd ... Q. No. 5

(c) Mr. Aronno deposited Tk. 45,000 in Bank 'A' and Tk 30,000 in Bank 'B' with interest rate 10% and Tk 25,000 in Bank 'C' with 15% interest rate. In Bank 'A' compounding is done annually and in Bank 'B' compounding is done semi annually and in Bank 'C' compounding is done twelve times a year. What will be his total deposit after 16 years? **(15)**

6. Ministry of Communication, GoB is now considering a new route for Metro rail project in Dhaka City. From technical point of view it is found that initial route is more feasible and would cost initial outlay of Tk. 1000 crore. The cash flow stream for two alternative routes are as follows.

Year	Alternative -1 (Crore Tk)	Alternative-2 (Crore Tk.)
0	− 1000	−1200
1	80	70
2	75	60
3	90	100
4	100	90
5	200	150
6	250	200
7	140	100
8	150	90
9	100	90
10	120	100

(a) Calculate the following for these two alternative routes:-

    (i) Discounted pay back period. **(6)**

    (ii) Net present value **(7)**

    (iii) Benefit-cost Ratio **(7)**

    (iv) Internal Rate of Return **(10)**

The discount rate is 12%

(b) Which alternative would you choose and why? **(5)**

7. (a) Describe the procedure of adjusting the difference between social value and economic value of merit or demerit of goods. Also give an example on it. **(15)**

  (b) RAJUK is considering two alternative layouts for its land development project in Purbachol of Dhaka which will be completed within next six years. The distribution of the net present value of two layouts is as follows: **(15)**

Layout - 1		Layout - 2	
NPV in million	Probability	NPV in million	Probability
2.5	0.2	4	0.3
3	0.5	2.5	0.5
4	0.3	3.5	0.2
5	0.4	6	0.3
7	0.4	8	0.4

PLAN 401

Which layout will be considered more risky?

(c) What are the common market imperfections found in developing countries? **(5)**

8. (a) Different activities of a project and their functional relationships are given below:

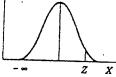| Activity	Optimistic (weeks)	Most Likely Time (weeks)	Pessimistic Time (weeks)
1-2	5	11	11
1-3	10	10	10
1-4	2	5	8
2-6	1	7	13
3-6	4	4	10
3-7	4	7	10
3-5	2	2	2
4-5	0	6	6
5-7	2	8	14
6-7	1	4	7

(a) Draw the network diagram. **(8)**

(b) Determine the critical path. **(10)**

(c) Find the probability of completion by 17 weeks. (Use Table -1) **(10)**

(d) State the time by which management will be 90 percent sure that the project completion will occur (Use table 1) **(7)**

Table 1. Cumulative (Single Tail) Probabilities of the Normal Probability Distribution
(Areas under the Normal Curve from $-\infty$ to Z)

Example: the area to the left of $Z = 1.34$ is found by following the left Z column down to 1.3 and moving right to the .04 column. At the intersection read .9099. The area to the right of $Z = 1.34$ is $1 - .9099 = .0901$. The area between the mean (dashed line) and $Z = 1.34 = .9099 - .5 = .4099$.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8880
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9932	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9960	.9961	.9962	.9963	.9964
2.8	.9974	.9975	.9976	.9977	.9969	.9970	.9971	.9972	.9973	.9974
2.9	.9981	.9982	.9982	.9983	.9977	.9978	.9979	.9979	.9980	.9981
3.0	.9987	.9987	.9987	.9988	.9984	.9984	.9985	.9985	.9986	.9986
3.1	.9990	.9991	.9991	.9991	.9988	.9989	.9989	.9989	.9990	.9990
3.2	.9993	.9993	.9994	.9994	.9992	.9992	.9992	.9992	.9993	.9993
3.3	.9995	.9995	.9995	.9996	.9994	.9994	.9994	.9995	.9995	.9995
3.4	.9997	.9997	.9997	.9997	.9996	.9996	.9996	.9996	.9996	.9997

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-4/T-1   BURP Examinations 2010-2011

Sub : **CE 439** (Basic Environmental Engineering)

Full Marks : 210   Time : 3 Hours

The figures in the margin indicate full marks.

Assume reasonable values for parameters not given.

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 primary and secondary pollutants? The national ambient air quality standard for ozone (1 hr) is 235 $\mu g/m^3$ or 0.12 ppm. Determine the ambient temperature that has been assumed in setting this standard. **(8)**

   (b) What measures are generally taken to prevent groundwater contamination from pour-flush latrines? What special measures are taken in high water table areas? Explain with appropriate figures/sketches. **(12)**

   (c) Schematically show how disease is transmitted from excreta via different routes, along with sanitation barriers to prevent such transmission. **(7)**

   (d) How does carbon monoxide (Co) affect oxygen carrying capacity of blood? Explain. **(8)**

2. (a) Why an "averaging period" is assigned with air quality standards of pollutants? Explain. On a particular day, air quality data at a monitoring station in Dhaka are as follows: $PM_{2.5}$ (24 hr) = 175 $\mu g/m^3$; PM_{10} (24 hr) = 250 $\mu g/m^3$; O_3 (8-hr) = 0.075 ppm. Determine AQI for each parameter and report AQI for that particular day (Table for calculating AQI provided). **(15)**

   (b) What do you understand by a "hygienic latrines"? What is the major difference between a pit latrine (e.g., a VIP latrine) and a pour-flush latrine? Explain. **(9)**

   (c) What are the major components of a small bore sewerage (SBS) system? Compared to conventional sewerage system, sewer diameter and sewer gradient could be considerably reduced in SBS system – Explain why. **(11)**

3. (a) Design a septic tank for a family of 12 members. The average wastewater flow rate is 130 lpcd and the tank is to be desludged every 2 years. The minimum hydraulic detention time is 1 day. In a neat sketch, show the different components of the designed septic tank, including details of chambers, inlet and outlet positions and depths of different zones. **(25)**

   (b) What do you understand by a "sanitary landfill"? With appropriate figures, show the methods commonly employed for venting of landfill gases. **(10)**

4. (a) Design leach pits for an alternating twin offset pit pour flush latrine for a family of 10 members with a design life of at least 2.5 years. The pits are to be constructed with concrete rings 1.2 m in diameter and 0.3 m in depth. The average wastewater flow rate is 7 lpcd. The soil is sandy loam with long-term infiltration rate of 28 L/m^2.day. Draw a neat sketch of the designed latrine. Also draw a neat sketch of the water seal (showing seal depth) to be used with this latrine. **(18)**

(b) What are the objectives of solid waste processing? List the commonly employed resource recovery options from solid waste. **(10)**

(c) On a global scale, what are the major sources of SO_x? How do SO_x affect building material? Explain. **(7)**

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

5. (a) The population data of a town is shown below. Using the data, estimate population of the town in 2015 and 2020 by least square parabola method. **(13)**

Year	1975	1980	1990	2000	2005
Population (Thousands)	60	65	90	135	165

(b) What do you understand by eutrophication? How does it affect water quality? What methods are commonly employed for controlling eutrophication? Explain. **(11)**

(c) What are the major objectives of wastewater treatment? Classify wastewater treatment systems and identify the constituents that are removed in each category of treatment. **(11)**

6. (a) What do you understand by biochemical oxygen demand (BOD)? The ultimate CBOD and BOD_5 (at standard condition) of a wastewater sample are 300 mg/L and 180 mg/L, respectively. Estimate 4-day CBOD of the wastewater at 27°C. **(15)**

(b) Which processes are commonly used in secondary treatment of wastewater? Explain the bacteria-algae symbiosis in a waste stabilization pond. **(11)**

(c) In which chemical forms inorganic arsenic (As) could be present in water? In which chemical forms As is likely to be present in groundwater of Bangladesh? **(9)**

7. (a) What is Darcy's law? Starting from Darcy's law, define coefficient of permeability and coefficient of transmissibility. **(9)**

(b) What are the commonly used methods of disinfection of potable water? Draw a typical break point chlorination curve and explain its major features. Write down the chemical reactions leading to the formation of chloramines. **(14)**

CE 439

Contd ... Q. No. 7

(c) What are the major alternatives to arsenic contaminated groundwater in Bangladesh? Schematically show the mechanism of arsenic removal from water by coagulation-adsorption-coprecipitation technique. Which coagulants are commonly used for arsenic removal? **(12)**

8. (a) Determine the dimension of a rectangular settling tank to treat 100 m^3 of water per hour when the overflow rate is 0.70 m/hr and the detention time is 2.5 hr. Using Stoke's law, also calculate the smallest size (diameter) of particle that will be removed with 100% theoretical efficiency in the tank at 20°C. (Assume laminar flow at 20°C, $\rho_w = 998.2$ Kg/m^3; $\mu = 1.002 \times 10^{-3}$ Kg/m.s; Specific Gravity of particle = 2.60). **(18)**

(b) How the arsenic contamination of groundwater could affect the agriculture sector in Bangladesh? Explain. **(8)**

(c) How does thermal pollution affect dissolved oxygen (DO) concentration of a water body? Explain. **(9)**

Table for Question 2(a)

Table 1: AQI for different pollutants (for ques. no: , 2(a)

Breakpoints							AQI
O_3 (ppm) 8-hr	O_3 (ppm) 1-hr (i)	$PM_{2.5}$ (µg/m³) 24-hr	PM_{10} (µg/m³) 24-hr	CO (ppm) 8-hr	SO_2 (ppm) 24-hr	NO_2 (ppm) Annual	
0.000-0.064	--	0.0-15.4	0-54	0.0-4.4	0.000-0.034	(ii)	0-50
0.065-0.084	--	15.5-40.4	55-154	4.5-9.4	0.035-0.144	(ii)	51-100
0.085-0.104	0.125-0.164	40.5-65.4	155-254	9.5-12.4	0.145-0.224	(ii)	101-150
0.105-0.124	0.165-0.204	65.5-150.4	255-354	12.5-15.4	0.225-0.304	(ii)	151-200
0.125-0.374	0.205-0.404	150.5-250.4	355-424	15.5-30.4	0.305-0.604	0.65-1.24	201-300
(iii)	0.405-0.504	250.5-350.4	425-504	30.5-40.4	0.605-0.804	1.25-1.64	301-400
(iii)	0.505-0.604	350.5-500.4	505-604	40.5-50.4	0.805-1.004	1.65-2.04	401-500

(i) In some cases, in addition to calculating the 8-hr ozone index, the 1-hr ozone index may be calculated, and the maximum of the two values reported
(ii) NO_2 has no short-term air quality standard and can generate an AQI only above 200
(iii) 8-hr O_3 values do not define higher AQI values ($\geq$301). AQI values of 301 or higher are calculated with 1-hr O_3 concentrations

Table for Question No. 2(a)