

**SECTION – A**

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

1. (a) Discuss the objectives of urban planning in the New Urban Agenda era. (12)  
(b) What do you understand by the term 'sustainable development'? How can urban planning be a powerful tool for achieving SDG 11? Explain briefly. (5+18=23)
  
2. (a) From your perspective, why does an urban planner need knowledge of activity systems? Interpret briefly. (17)  
(b) Discuss the three sets of land use values. (12)  
(c) Identify the key differences between the terms 'Land Use' and 'Land Cover'. (6)
  
3. (a) Illustrate the hierarchy of city centers with examples. (10)  
(b) Describe the principles of designing an urban center with special reference to pedestrian movement and vehicular traffic. (5+5=10)  
(c) As a planner, what principles would you consider for an industrial park development? Analyze briefly. (15)
  
4. (a) Interpret the classification of industries according to the locational characteristics and effects on the environment with relevant examples. (10)  
(b) You are assigned to prepare a manual for transit-oriented development in Dhaka city. As TOD is a context-specific planning approach, what would be your suggestions for implementing TOD around the stations of MRT Line 6? Explain. (15)  
(c) Compare the features of "rectangular pattern" and "linear pattern" of city forms with examples. (10)

**PLAN 211/URP**

**SECTION – B**

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

5. (a) Illustrate the salient features of "sector theory" and identify its similarities with "concentric zone theory" (10)
- (b) "Urban planning and public health needs to be integrated" — defend this statement. (12)
- (c) Interpret the concept of "sponge city" and discuss its potential to be adopted in urban areas of Bangladesh. (13)
6. (a) Kevin Lynch reasserted the human role in the interpretation of the city — explain this statement and discuss the elements of city image. (3+15=18)
- (b) Critically discuss the conservation of wetlands of Dhaka in the light of policies, plans and acts. (17)
7. (a) Relate the characteristics of Multiple Nuclei theory with the urban structure of Dhaka city. (12)
- (b) Examine the role of an urban planner to promote the objectives of "Healthy City". (18)
- (c) Appraise the concept— "Land Ethics" introduced by Aldo Leopold. (5)
8. (a) As a resident of Dhaka city, examine the assumptions of Huff's Gravity model from your experience. (12)
- (b) Compare the scenarios where following conservation tools can be applied: (15)
- (i) Restoration
  - (ii) Adaptive reuse
  - (iii) Replication
- (c) Distinguish between the characteristics of Neighbourhood shopping center and Regional shopping center. (8)
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**SECTION – A**

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

1. (a) Give definition of "site and area planning". Outline the design steps followed in site and area planning. (10+10=20)  
(b) Demonstrate the criteria for selecting an industrial district. (15)
2. (a) Interpret air movement of different types of sites. (20)  
(b) Briefly explain the noise control measures in the perspective of site and area planning. (15)
3. (a) "Every natural and man-made site (unique to some extent) is a connected web of things and activities"— Explain the quoted sentence in your own words. (20)  
(b) Briefly explain the principles of planning shopping centres with its common configurations. (15)
4. Explain the following topics:
  - (a) Landscape component (15)
  - (b) Grading (10)
  - (c) Drainage (10)

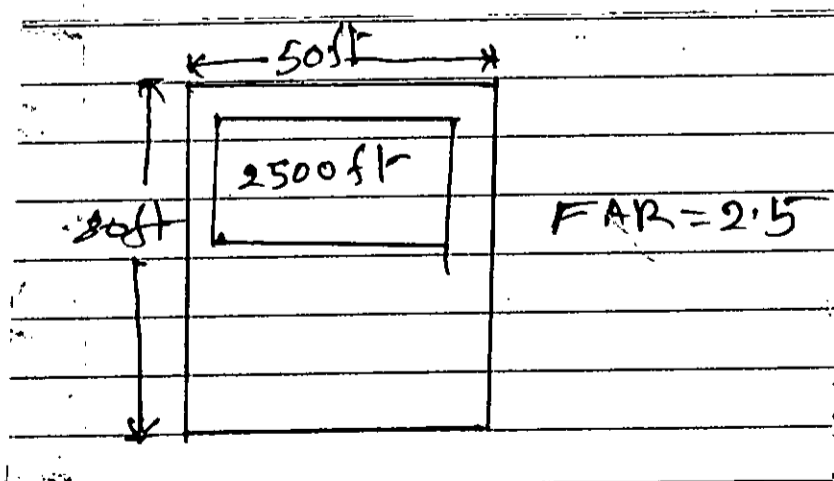
**SECTION – B**

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

5. (a) "Though a cul-de-sac pattern provides a pleasant look, this pattern is discouraged in sub-division planning" — Illustrate this statement with an appropriate example. (10)  
(b) Explain why a new development in a neighborhood is needed to be consistent with the existing design and should not take the form of an isolated project. (10)  
(c) Discuss the conditions for designing the separate and the combined sanitation system in a residential area. (8)  
(d) Discuss the terms 'plot' and 'plot frontage' with necessary diagrams. Also, discuss the concept of 'block' with an example. (7)

PLAN 217/URP

- 6. (a) Identify the core theme of a neighborhood design. As an urban planner, how will you apply this theme to maintain the accessibility standard to ensure safety in a neighborhood? (12)
- (b) Explain why housing diversity has a significant influence on a good neighborhood design. (10)
- (c) Develop a diagram showing the mechanics of grouping of wells, an option of water supply in a residential community. Prepare a checklist of the basic consideration for the design of a storage tank used for storing both rainwater and potable water. (5+3=8)
- (d) Among the three (03) types of solar system which one can be related to serve the purpose of a 15 storied high-rise building (1<sup>st</sup> - 7<sup>th</sup> floor commercial, 8<sup>th</sup> - 15<sup>th</sup> floor-residential). (5)
  
- 7. (a) Illustrate the characteristics of the sub-division pattern that groups the units into cluster of a greater density using an appropriate diagram. (15)
- (b) Outline the basic design criteria for the arrangement of electric line in a residential area. (10)
- (c) Develop an elaboration of neighborhood planning practices in "The Central Austin Combined Planning Neighborhood area". (10)
  
- 8. (a) Illustrate different types of drainage system. Prepare a comparative scenario between the two major aspects of rainwater harvesting. (8)
- (b) Develop some strategies to create variation in house grouping in curve streets. (8)
- (c) Discuss the term "Neighborhood Area Networking". "The infrastructure of internet is global, but from the users' perspective, it is always local in nature" — Taking example from the residential areas of Old Dhaka, interpret this statement. (4+8=12)
- (d) A plot owner wants to construct a building having four (04) floors over the plot area of 4000 sq.ft. The Floor Area Ratio (FAR) is 2.5. Compute the covered area of the building, if all the floors are constructed having same area. The plan view of the plot is given here: (7)



**SECTION – A**

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

1. (a) What do you understand by statistical estimation? Describe the terms estimation, estimator, and estimate, with relevant examples. (10)
- (b) Fifty-four randomly selected rural households were asked about their monthly family hygiene budget. The sample produce a mean of Tk. 351 and a standard deviation of Tk. 62. Develop a 98% confidence interval for the corresponding population mean. (12)
- (c) In a survey of 3210 MRT-6 passengers, 65% of them are male, and 35% are engaged in a formal job. The analysis of the data reveals that 42% of the respondents previously used bus for this route. Now, compute a 95% confidence interval for the corresponding population who have previously used the bus for this route. (13)
2. (a) Describe the difference between probability sampling methods and nonprobability sampling methods with relevant examples. (10)
- (b) Describe why the width of the confidence interval matters and how the width of the confidence interval could be narrowed down. (10)
- (c) Consider a disease with a 0.5% incidence rate. A medical test is used to confirm this disease. The test has a 9% false positive (test positive even though they don't have the disease) rate; and a 3% false negative (testing negative given that they has a disease) rate. A randomly selected participant tests positive. What is the probability that this person actually has the disease? Calculate the probability that this person actually has the disease, if the person is tested for positive for the second time. (15)
3. (a) Differentiate between the sample distributor and sampling distribution with appropriate examples. (10)
- (b) What do you understand by Human Development Index? Describe the types of index numbers with relevant examples. (12)
- (c) RAJUK claims that 68% of Dhaka's residents believe that their newly gazetted planning document would solve many of the existing major problems. Assuming that their claim is true, what is the probability that in a random sample of 2000 residents, more than 70% would have their belief? (13)
4. (a) Explain the importance and conditions of the central limit theorem. (10)
- (b) A study on 12,020 households found that on average each household produces 6.7 kg of solid waste daily with a standard deviation of 1.8 kg. Calculate the probability that a randomly selected family would generate between 5 to 9 kg of solid waste daily. Assume that the daily amount of solid waste generation per family is normally distributed. (12)

**PLAN 291**

(c) Assume the arrival of customers at a WASA water ATM booth follows a Poisson distribution with a constant rate of 12 customers per hour. If the ATM booth is out of service for 10 minutes, calculate the probability that more than one customer arrived for water during that time. How many customers may the authority expect during the above mentioned 10 minutes? (10+3=13)

**SECTION – B**

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

5. (a) Explain the following terms: population, sample, variable and data. (20)  
(b) Calculate the mode for the following distribution. (15)

Class	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80
Frequency	4	4	13	5	6	5	2	1

6. (a) Explain with example the levels of measurement. (10)  
(b) The following table shows the distribution of the number of hours worked each week (on average) for a sample of 100 university students. Calculate the mean, mean deviation, variance, and standard deviation. (25)

Hours worked per week	Number of students
0 – 9	25
10 –19	13
20 – 29	40
30 – 39	18
40 – 49	4

7. You have the following data set.  
(a) Prepare the frequency table by using four classes. (20)  
(b) Sketch frequency histogram, frequency polygon and ogive for the following data. (15)

11	16	9	22	21	12
13	14	10	23	22	17
18	12	9	18	29	22
22	18	17	19	26	21
13	21	19	22	23	13

8. You have given the following problem. Measure skewness and Kurtosis using moments. Calculate first four central moments of the following observations and also calculate the values of measure of skewness (b1), measure of Kurtosis (b2), coefficient of skewness (r1) and coefficient of Kurtosis (r2). (35)

16	17	22	21	24
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Table-02

Upper critical values of student's t distribution with  $\nu$  degrees of freedom

$\nu$	Probability of exceeding the critical value					
	0.10	0.05	0.025	0.01	0.005	0.001
1.	3.078	6.314	12.706	31.821	63.657	318.313
2.	1.886	2.920	4.303	6.965	9.925	22.327
3.	1.638	2.353	3.182	4.541	5.841	10.215
4.	1.533	2.132	2.776	3.747	4.604	7.173
5.	1.476	2.015	2.571	3.365	4.032	5.893
6.	1.440	1.943	2.447	3.143	3.707	5.208
7.	1.415	1.895	2.365	2.998	3.499	4.782
8.	1.397	1.860	2.306	2.896	3.355	4.499
9.	1.383	1.833	2.262	2.821	3.250	4.296
10.	1.372	1.812	2.228	2.764	3.169	4.143
11.	1.363	1.796	2.201	2.718	3.106	4.024
12.	1.356	1.782	2.179	2.681	3.055	3.929
13.	1.350	1.771	2.160	2.650	3.012	3.852
14.	1.345	1.761	2.145	2.624	2.977	3.787
15.	1.341	1.753	2.131	2.602	2.947	3.733
16.	1.337	1.746	2.120	2.583	2.921	3.686
17.	1.333	1.740	2.110	2.567	2.898	3.646
18.	1.330	1.734	2.101	2.552	2.878	3.610
19.	1.328	1.729	2.093	2.539	2.861	3.579
20.	1.325	1.725	2.086	2.528	2.845	3.552
.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....
51.	1.298	1.675	2.008	2.402	2.676	3.258
52.	1.298	1.675	2.007	2.400	2.674	3.255
53.	1.298	1.674	2.006	2.399	2.672	3.251
54.	1.297	1.674	2.005	2.397	2.670	3.248
55.	1.297	1.673	2.004	2.396	2.668	3.245
56.	1.297	1.673	2.003	2.395	2.667	3.242
57.	1.297	1.672	2.002	2.394	2.665	3.239
58.	1.296	1.672	2.002	2.392	2.663	3.237
59.	1.296	1.671	2.001	2.391	2.662	3.234
60.	1.296	1.671	2.000	2.390	2.660	3.232
61.	1.296	1.670	2.000	2.389	2.659	3.229
62.	1.295	1.670	1.999	2.388	2.657	3.227
63.	1.295	1.669	1.998	2.387	2.656	3.225
64.	1.295	1.669	1.998	2.386	2.655	3.223
65.	1.295	1.669	1.997	2.385	2.654	3.220
66.	1.295	1.668	1.997	2.384	2.652	3.218
67.	1.294	1.668	1.996	2.383	2.651	3.216
68.	1.294	1.668	1.995	2.382	2.650	3.214
69.	1.294	1.667	1.995	2.382	2.649	3.213
70.	1.294	1.667	1.994	2.381	2.648	3.211
71.	1.294	1.667	1.994	2.380	2.647	3.209



**SECTION – A**

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

1. (a) Define natural greenhouse and man-made greenhouse. Write about the sources of global warming. (10)  
(b) Explain the different methods to save the environment. (15)  
(c) Describe the types of pollution. Briefly discuss the major pollution issues in Dhaka city. (10)
2. (a) Define industrial revolution and capitalism. (10)  
(b) Discuss the consequences of capitalism. (15)  
(c) What is the Fourth Industrial Revolution? Discuss the social impact of the fourth industrial revolution. (10)
3. (a) Define city, megacity and smart city. (10)  
(b) Write down the different sources of social change. (15)  
(c) Briefly discuss the Malthusian population theory. (10)
4. Write short notes on any **THREE** of the following: (35)  
(a) Greenhouse gases  
(b) Functions of the family  
(c) Hazard and disaster  
(d) 'Orange A' category industry and 'Orange B' category industry.

**HUM 179/URP**

**SECTION - B**

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

5. (a) Define culture. Discuss the ways in which language shapes and reflects cultural values, beliefs, and social practices. (15)
- (b) Explain significant roles of sub culture, counter culture and ethnocentrism with suitable examples. (20)
6. (a) What is sociological imagination? Discuss how sociological imagination can both limit and empower individuals in their ability to think critically and make decisions. (15)
- (b) Discuss the underlying factors that contributed to the development of sociology as an independent discipline. (20)
7. (a) What is social stratification? Critically discuss the properties of caste system and social class system of social stratification. (15)
- (b) What is research methodology? Explain the detailed steps involved in conducting a social research on low-income housing facilities in diverse urban population. (20)
8. (a) What do you understand by globalization? Briefly discuss the social and cultural impacts of globalization. (15)
- (b) Define deviance, white collar crime and juvenile delinquency. (10)
- (c) Briefly discuss the causes of crime. (10)
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**SECTION – A**

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

1. (a) Why is artificial cement popular? (4 ⅓)  
 (b) What type of cement shall be used in highway pavement or road construction?  
 Write a short note on that type of cement. (2+5=7)  
 (c) What are the factors affecting the hydration of cement? Write short notes on cement silos, blended cement, soundness of cement, and white Portland cement. (4+8=12)
  
2. (a) Write down the functions of cement, coarse aggregates, fine aggregates, and water in concrete. (8)  
 (b) Calculate the quantity of materials required to produce 100 ft<sup>3</sup> of concrete with mix proportion of 1:1.25:2.50. (6 ⅓)  
 (c) Write short notes on the Curing of concrete, Bleeding of concrete, and Compaction of concrete. (9)
  
3. (a) Why does corrosion occur in metal? Which factors affect corrosion? (2+5 ⅓=7 ⅓)  
 (b) What measures should be taken to prevent corrosion in Steel members? (6)  
 (c) What is Fiber reinforced polymer (FRP)? What are the uses of FRP in Civil Engineering? (4+6=10)
  
4. (a) What is Ferrocement? Draw a typical section of ferrocement and list the component materials of ferrocement. (2+3+3=8)  
 (b) Explain spalling of concrete with a figure. (3 ⅓)  
 (c) Explain with a neat sketch how ferrocement can be used to repair a damp wall. (12)

**SECTION - B**

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

5. (a) List the artificial wood products with their manufacturing processes and uses. Explain the advantages and disadvantages of using plywood. (7)
- (b) Briefly explain the deleterious substances in aggregate and their effects on Portland cement concrete. (7)
- (c) Briefly explain the different methods of lime slaking. Differentiate between the different types of lime. (9 1/3)
6. (a) List the application of lime as building and construction material. Explain the lime and lime mortar cycle. (6)
- (b) Define seasoning of timber. List the different types of artificial seasoning available for timber. Describe the advantages and disadvantages of 'kiln seasoning' of timber. (8)
- (c) Estimate the mix ratio of Aggregates 1, 2, 3, and 4 to obtain the aggregate blend to meet the specification. Also determine the % passing for the combined aggregate in each sieve and the FM of the combined aggregate. (9 1/3)

Sieve Size		% passing				Specification
mm	inch	Aggregate 1	Aggregate 2	Aggregate 3	Aggregate 4	% Passing
175	7	100	-	-	-	
150	6	98	-	-	-	
100	4	30	100	-	-	
75	3	10	92	-	-	56
50	2	2	30	100	-	
37.5	1.5	0	6	94	-	28
25	1	0	4	36	100	
19	3/4	0	0	4	92	12
9.5	3/8	0	0	2	30	
4.76	No. 4	0	0	0	2	

**CE 209/URP**

7. (a) Five first class brick samples are tested for absorption and compressive strength. Bricks are cut into identical halves along the length. Following results are obtained from the test. Calculate compressive strength and absorption capacity of brick. Assume, dry unit weight of the brick = 100 lb/ft<sup>3</sup> and average depth of each brick = 2.75 inch. Compression testing machine calibration equation:  $Y \text{ (lb)} = 1.0471X - 5.3621$  (10 1/3)

Sample	Dimension (inch)				Observed Load (lb)	SSD wt of brick (lb)
	Side-1		Side-2			
	L	W	L	W		
1	4.50	4.55	4.55	4.60	51245	3.65
2	4.60	4.55	4.60	4.55	52410	3.69
3	4.45	4.55	4.55	4.45	50690	3.58
4	4.60	4.55	4.50	4.60	51355	3.53
5	4.60	4.60	4.50	4.50	51855	3.61

- (b) List the possible moisture states in aggregates. Explain different types of specific gravity of aggregate and their relations. Define alkali-aggregate reactivity and the controlling process. (8)
- (c) Classify sands based on Unified Soil Classification System (USCS) under ASTM D 2487 and mention their properties and uses. (5)
8. (a) List the laboratory tests available for sand. Briefly explain bulking of sand with necessary diagrams. (6 1/3)
- (b) Classify and describe the different types of bricks based upon the physical and mechanical properties. Write down the defects and their effects on bricks. Briefly explain the different manufacturing processes used in brick production. (10)
- (c) Moist mass of sand sample is 28.35 kg and dry mass is 25.69 kg. If the absorption capacity is 4.3%, determine (i) total moisture content and (ii) free moisture content. Later, 50 kg of gravel is mixed with this moist sand sample. The gravel has a moisture content of 0.3% and absorption of 5.7%. What is the amount of water required to reach the SSD condition for both gravel and sand? (7)

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