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**SECTION – A**

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

1. (a) "Ebenezer Howard's Garden City Concept was more than just a physical blueprint" — Justify the statement and explain why it was an influential and revolutionary concept in urban planning? (20)  
(b) Briefly describe the important post-modern planning thoughts which evolved in the late 20<sup>th</sup> century. (8)  
(c) Briefly discuss Sir Patrick Geddes' principles of town planning. (7)
2. (a) What do you understand by Ecological models of the city? Describe the process of 'invasion' and 'succession' of land use according to Burgess' Concentric Zone Theory. (10)  
(b) Explain Multiple Nuclei Theory with a neat diagram. (15)  
(c) What factors need to be considered for feasibility and economic analyses of shopping center development? Illustrate Huff's gravity model with example. (10)
3. (a) "Planning for commercial and employment centers is a challenge to find a fit among three aspects" — Explain this statement. (5)  
(b) Briefly describe the characteristics of contemporary shopping facilities in Dhaka. (15)  
(c) What is 'Adaptive reuse' of historic sites? Describe with example. (7)  
(d) Distinguish between 'conservation' and 'preservation' of historic sites. (8)
4. (a) Discuss the appropriate intervention methods and management tools for conservation of heritage sites. (10)  
(b) Discuss the importance of open space from social, environmental and economic points of views. (10)  
(c) Briefly discuss the present urbanization trend of Bangladesh and its associated consequences. (15)

**PLAN 211**

**SECTION – B**

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

5. (a) Define urban planning. Describe the significance of urban planning. **(4+4=8)**  
(b) "Land use planners should consider land from different aspects to manage and control urban growth" — Explain briefly. **(27)**
6. (a) What principles should be followed to ensure the efficient movement of pedestrian and vehicular traffic in the Town Centre? **(14)**  
(b) Briefly describe measures to control location of industries. **(15)**  
(c) State the importance of establishing residential density standards. **(6)**
7. (a) Why is it important to seek a balance mixed and segregated land uses in urban planning? **(6)**  
(b) Define Floor Area Ratio (FAR). How FAR can act as an effective density control measure in the context of Dhaka city? Explain. **(5+15=20)**  
(c) Describe the functions of residential neighborhood. **(9)**
8. (a) What problems may arise when land use planning is dictated by transportation planning? **(5)**  
(b) Write down the major landuse components of a town. Briefly describe any four of those components. **(25)**  
(c) What are the factors on which the functional efficiency of a town depends? **(5)**
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**SECTION – A**

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

1. (a) How do you define physical environment and man-made environment? (5)  
(b) What do you mean by human-ecology and pollution? (6)  
(c) Define with examples orange category-A industry and orange category-B industry. (12)  
(d) Briefly explain the negative impacts of global warming. (12)
  
2. (a) What do you know about industrial revolution and capitalism? What are the negative impacts of capitalism on society? (10)  
(b) Critically discuss the Malthusian population theory. (10)  
(c) What are the socio-economic differences among 'pre-industrial cities', 'industrial cities' and 'post industrial cities'? (15)
  
3. (a) Identify the types of poverty in your society. (10)  
(b) Critically discuss the world system theory of development. (10)  
(c) Illustrate the factors facilitating juvenile delinquency in Bangladesh. (15)
  
4. Write short notes on any **THREE** of the followings: (35)  
(a) Disposable society  
(b) Sources of social change  
(c) Advantages and disadvantages of joint family  
(d) Push-pull model of migration.

**SECTION – B**

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

5. (a) 'Sociological imagination is an empowering tool; allows us to look beyond our limited experiences' — Explain this statement with suitable examples. (10)  
(b) Write the relationships between sociology and social sciences. (10)  
(c) Critically discuss the functionalist theoretical perspective of sociology. (15)

**HUM 179/URP**

6. (a) If you conduct a study on 'Face book and social interactions' how will you design your research? Explain highlighting different steps of doing research in social sciences. **(20)**
- (b) What is 'code of ethics' in social research? How should social scientists maintain these ethics while doing social research? **(15)**
7. (a) To what extent do you yourself live in public through your use of the internet and other new technologies? How might your actions be monitored using these technologies? **(20)**
- (b) In what ways is globalization just a friendlier term for neo-imperialism? **(15)**
8. Write short notes on any three of the following: **(35)**
- (a) Caste system and class system.
  - (b) Horizontal mobility and vertical mobility.
  - (c) Subculture and counter culture.
  - (d) Ethnocentrism and dominant ideology.

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Sub : **CE 209** (Construction Materials and Civil Engineering Structures)

Full Marks: 140

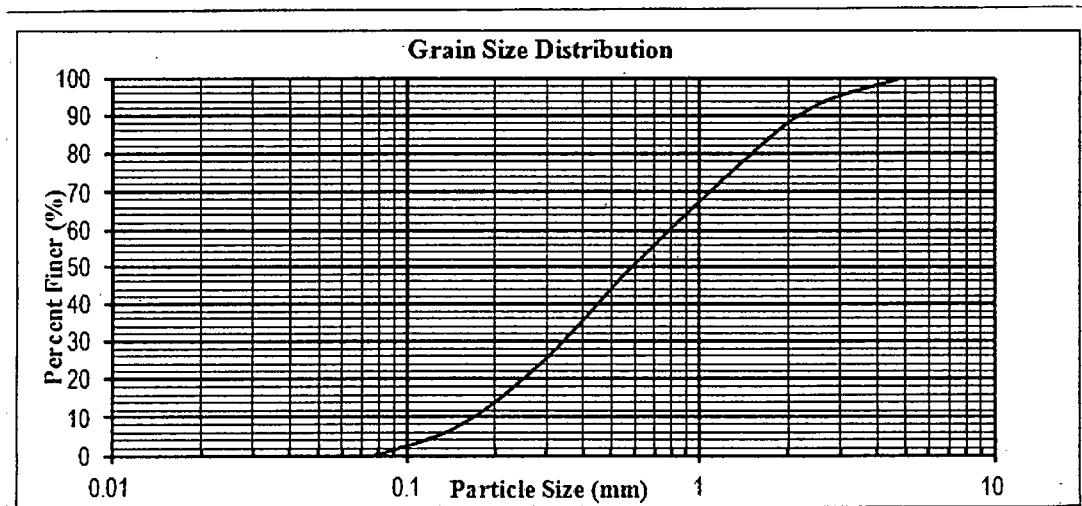
Time : 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks.

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

1. (a) Write in a tabular form the soil-moisture scale showing Atterberg's limits, corresponding physical state, and approximate consistency of remolded soil. (13  $\frac{1}{3}$ )  
 (b) Briefly explain the Compressibility and Permeability properties of soil. (10)
  
2. (a) Write short notes on: (4×3=12)
  - (i) Workability of concrete
  - (ii) Bleeding of concrete
  - (iii) Slump test
  - (iv) Segregation of concrete
 (b) A pile cap group contains 6 piles. The length and diameter of each pile is 50 ft and 18 in. respectively. If the concrete mix ratio for constructing both pile cap and piles is 1:2:4 (by Volume), how many bags of cement are required to prepare concrete for this pile foundation? Also, mention the amount of sand (cft), aggregate (cft) and water (litre) required to prepare concrete mix, if the water cement ratio is 0.50 (by Weight). Given: dimensions of pile cap are 10 ft long, 10 ft wide and 10 in. thick. (11  $\frac{1}{3}$ )
  
3. (a) The gradation curve of an aggregate mix is given below. Using this curve determine the Fineness Modulus of aggregate mix. (11  $\frac{1}{3}$ )



- (b) Write down the distinctive characteristics of the following cements in usage and ingredients over OPC: (3×4=12)
  - (i) Low heat cement
  - (ii) Quick setting cement
  - (iii) Air entraining cement

CE 209/URP

4. (a) Write in a tabular form the difference between igneous stones and metamorphic stones. (8)
- (b) Write down the suitability of sea sand with river sand for use in concrete and mortar. (7 1/3)
- (c) Write short notes on FRP and Galena. (8)

SECTION – B

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

5. (a) Draw a neat sketch of timber section and show different parts of it. (5)
- (b) Describe the 'knots' and 'radial shakes' types of defects of tree. (6)
- (c) Describe briefly various field tests for bricks. (6 1/3)
- (d) Draw typical cross-section of flexible pavement and rigid pavement (6)
6. (a) Differentiate between: (5×3=15)
- (i) Heart wood and sap wood.
- (ii) 1st class and 2nd class brick
- (iii) Arch bridge and suspension bridge.
- (iv) Load bearing structure and frame structure.
- (v) Wild flooding and check flooding.
- (b) Describe the operation procedure of Hoffman's Kiln with neat sketch. (8 1/3)
7. (a) Write short notes on "Levee & Reservoir". (4)
- (b) Subsoil formation of a particular site indicates the requirement of deep foundation. In such circumstances, which type of pile foundation (Precast/Cast-in-situ) will you prefer? Why? (9 1/3)
- (c) Write down the basic steps for construction of single footing? Do you think, any additional step is required for constructing mat foundation? If any, mention the steps. (10)
8. (a) Determine the volume of water required to be diverted from the head works to irrigate area of 5000 ha. Total Consumptive use of the crop is 124.09 cm and total precipitation of that area is 55.8 cm. Assume 80% as the effective precipitation to take care of the consumptive use of the crop. Also assume 50% efficiency of water application in the field and 75% as the conveyance efficiency of canal. (12)
- (b) Draw a typical layout of an irrigation canal network. (5 1/3)
- (c) Write down the advantages and disadvantages of 'natural seasoning' of timber. (6)

**SECTION – A**

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

1. (a) There are mainly three approaches to calculate probability. Briefly explain the approaches with relevant examples. (10)
- (b) Calculate the probability of getting a total of nine in rolling two dices simultaneously. (10)
- (c) Assume that travel time from Nazrul Islam Hall to the BUET Campus by bicycle is a normal random variable with mean  $M = 8$  minutes and standard deviation  $\sigma = 2$  minutes. If 91% of the bike users take longer to reach the campus than you do, compute your approximate travel time from Nazrul Islam Hall to BUET Campus by bicycle. (15)
  
2. (a) Differentiate between discrete probability distribution and continuous probability distribution with relevant examples. (8)
- (b) Suppose the number of cars arriving at a certain intersection follows a Poisson Distribution with an arrival rate of 25 cars per minute.
  - (i) Find the probability of exactly 100 arrivals in a 5 minutes interval. (5)
  - (ii) Find the probability of less than 5 arrivals in a 10 seconds interval. (10)
- (c) After conducting an income-expenditure survey at Korail Slum, a research team claimed that 60% of all the households in the slum have a monthly saving of taka 1000 or more. Assume that the claim is true. Now compute the probability that in a random sample of 300 households taken from Korail Slum, less than 55% will have a monthly saving of taka 1000 or more. (12)
  
3. (a) Discuss the characteristics of normal probability distribution with necessary illustrations. (10)
- (b) Suppose a population is estimated to have a standard deviation of 10. You want to estimate population mean within 2 margin of error and with a 90% level of confidence. Calculate the sample size that you would require to estimate the population mean. (13)
- (c) According to a survey of 1500 adults conducted in Rangpur, 26% of adults are found to be not engaged in any formal occupation. Construct a 95% confidence interval for the corresponding population. (12)

**PLAN 291/URP**

4. (a) Differentiate between stratified sampling and cluster sampling with appropriate examples. (8)
- (b) Suppose a study shows that in Dhaka 45% of the households who earn between taka 50,000–60,000 per month, tend to own a private car. You have taken a sample of 10 households who earn between taka 50,000–60,000 per month. What is the probability that exactly six households will own a private car? (12)
- (c) The mean daily wage of workers in a factory is taka 180 and the standard deviation is taka 16. If the wages are normally distributed, find the probability that
- (i) a worker selected at random from the factory earns a daily wage more than taka 185. (5)
- (ii) a worker selected at random from the factory earns a daily wage between taka 170 and 190. (10)

**SECTION – B**

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

5. (a) Discuss about the four levels of measurement of data. Give an example of dataset for each level. (20)
- (b) The table below shows the daily travel times of 200 private service holders residing in Dhaka. (15)

Travel Time (mins)	No. of Trip Makers
0 – 20	10
20 – 40	30
40 – 60	50
60 – 100	80
100 – 120	20
120 – 150	10

Using this dataset, draw a cumulative frequency curve and find the percentage travelers having travel times below 90 minutes.

6. (a) With relevant examples, distinguish between the applications of arithmetic mean and geometric mean. (10)
- (b) Explain how the values of Kurtosis and Skewness can be used to comment on the normality and the uniformity of a distribution. (10)
- (c) The Madhupur upazila of Tangail district has a population of 309,000 in 2011. If the population growth rate is 2.15% per year, what was the population in this upazila at 1981? (15)



**PLAN 291/URP**

7. (a) Why do we need a measure of dispersion to explain a distribution in addition to a measure of central tendency? Use examples to clarify your answer. **(10)**

(b) The following dataset shows the weight of 150 individuals grouped into seven classes.

Weight (pounds)	No. of Individuals
97 – 105	7
105 – 113	13
113 – 121	20
121 – 129	41
129 – 137	36
137 – 145	25
145 – 153	8

(i) Calculate the mean and mode for the above dataset. **(15)**

(ii) Using the previous answer, comment on the skewness of the distribution of weights. **(10)**

8. (a) Discuss about the relative benefits and disbenefits of using mean and median to measure the central tendency of a distribution. **(10)**

(b) The following table shows the distribution of heights of 100 individuals.

Height (inches)	No. of Individuals
63.0 – 64.5	4
64.5 – 66.0	8
66.0 – 67.5	23
67.5 – 69.0	30
69.0 – 70.5	16
70.5 – 72.0	19

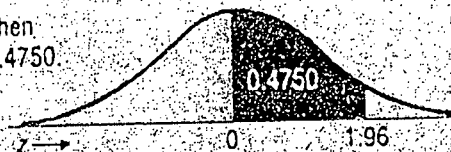
(i) For the above dataset, find the first quartile, fifth decile and 75th percentile. **(15)**

(ii) Use these values to prepare a box-and-whisker plot to show the distribution of heights. **(10)**

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# Areas under the Normal Curve

Example:  
If  $z = 1.96$ , then  
 $P(0 \leq z) = 0.4750$



$z$	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990

= 4 =

**SECTION – A**

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

1. (a) What is the relevance of slope and topography in context with site planning? If elevation difference between two contours is 40 m and the two contours are 100 m away from each other in a uniformly sloped site, what kind of development or use will you propose there as a planner? **(8+6=14)**
  - (b) You have been assigned as a site planner to develop a vacant site as a residential neighborhood. What type of user analysis techniques are you going to apply for this purpose? Justify your answer. **(21)**
  
2. (a) What is the difference between coarse mesh and first flush devices in a rainwater harvesting system? Draw with a neat sketch a typical rainwater harvesting system with its components. **(5+8=13)**
  - (b) What are the solutions for managing sewerage from new residential development? Which type is the most preferable one and why? **(4+6=10)**
  - (c) What are the system setup requirements for providing water supply for a residential community? **(12)**
  
3. (a) What are the characteristics of a successful enclosure? **(8)**
  - (b) Differentiate among albedo, conductivity and specific heat. How do albedo, conductivity and specific heat of natural and man-made setting affect site planning decisions? **(8+15=23)**
  - (c) What is a shelter-break? **(4)**
  
4. (a) Define the following– **(4×4=16)**
  - (i) surrogate user
  - (ii) hard and soft landscaping elements
  - (iii) schematic plan
  - (iv) angle of response
  - (b) When does an urban area have a heat island effect and how can this be overcome? **(10)**
  - (c) You are assigned to plan a residential site. What stages are you going to follow to prepare the plan? **(5)**
  - (d) Why monitoring and supervision is important after the implementation of a plan? **(4)**

**PLAN 217**

**SECTION – B**

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

5. (a) What are the different patterns of layout in sub-division planning? **(10)**  
(b) Show with diagrams how does building bye-laws help to develop and improve local areas in the city? **(20)**  
(c) Why graphical representation is important in this regard? **(5)**
  6. (a) What is FAR? Show possible building configurations for 0.25 FAR. **(18)**  
(b) How do building height, massing and FAR relate? **(17)**
  7. What should be the ratio of building heights to thoroughfare widths? Show with diagrams different types of road widths with 2-storey buildings on both sides of the street. **(10+25=35)**
  8. Show with diagrams how bio-retention applications in the design of parking lots help reduce flooding and water lagging in the city. **(35)**
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