BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA
L-2/T-1   BURP Examinations 2020-2021
Sub: **PLAN 211** (Urban Planning Principles)
Full Marks: 210   Time: 3 Hours
The figures in the margin indicate full marks
USE SEPARATE SCRIPTS FOR EACH SECTION

SECTION – A
There are **NINE** questions in this section. Answer any **SEVEN** questions.

1.   "Urban planning is an important tool for achieving sustainable development." Explain
the statement.   **(15)**

2.   (a) What criteria need to be followed while declaring an urban area as a city
corporation according to Local Government (City Corporation) Act 2009?   **(6)**
(b) The capital city of Bangladesh is not only a mega city but also a primate city.
Explain with necessary arguments.   **(9)**

3.   (a) Distinguish between mixed and segregated land uses.   **(5)**
(b) Planners often need to arrive at a compromise between mixed and segregated land
use allocation. Why? Explain briefly.   **(10)**

4.   "Land is both an input to, and a product of the planning process." Do you agree with
the statement? Justify your answer.   **(15)**

5.   Being an urban planner, you may need to analyse the developability of an urban land
for residential purpose. What techniques would you use to analyse the land's
developability? Mention your arguments of selecting each of the techniques.   **(15)**

6.   With the inception of Mass Rapid Transit (MRT) projects, the next phase of
development plans of Dhaka is going to encourage Transit Oriented Development
(TOD). Traditionally TOD is a tool for neighbourhood planning and design. But in the
last couple of decades, it has been promoted for its intricate relationship between urban
transport system and settlement pattern.   **(15)**
Now if you are involved in residential neighbourhood planning project around MRT
stations, what principles would you follow to plan the neighbourhoods around these
transit stations?

7.   For appropriate scale of development in city centres, the local context and character
should be respected. Explain the statement with relevant examples.   **(15)**

8.   In the context of developing an industrial park in an urban area—
(a) What do you understand by 'infrastructure assessment'?   **(6)**
(b) What principles would you follow to ensure zoning within the park?   **(9)**

9.   Write short notes on the following-   **(7 $\frac{1}{2}$ ×2=15)**
(a) Satellite town,
(b) City centre as a place of relax.

PLAN 211/URP

SECTION – B

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

10. (a) "The materials of city planning are: sky, space, trees, steel and cement; in that order and that hierarchy" — explain this statement of Le Corbusier. **(8)**

    (b) Present a comparative discussion on "Concentric Zone Theory" and "Multiple Nuclei Theory". **(14)**

    (c) In the context of Bangladesh, present a list of urban planning interventions to ensure healthy life style in a city. **(13)**

11. (a) Briefly discuss the locational requirement for employment areas. **(10)**

    (b) Describe the categories of local open spaces. As a planner, which issues would you consider while selecting location and size for local open spaces. **(10+7=17)**

    (c) What are the major barriers of historic conservation in Bangladesh? **(8)**

12. (a) Discuss the importance of open spaces in terms of health, economic, environmental and social point of view. **(15)**

    (b) Compare the concepts of Frank Llyod Wright and Le Corbusier regarding city planning. **(10)**

    (c) Write a short note on Huff's Gravity model. **(10)**

13. (a) Discuss the importance of integrating public health and urban planning from a historic perspective. **(12)**

    (b) Briefly explain the association of urban planning approaches and its impact on communicable and non-communicable diseases. **(15)**

    (c) Explain with a relevant example why "Restoration" is considered as the most rigorous process of historic preservation? **(8)**

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   BURP Examinations 2020-2021

Sub : **PLAN 217** (Site and Area 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**.

1. (a) How topography and parking requirements control the design of a cul-de-sac?   (7)

    (b)
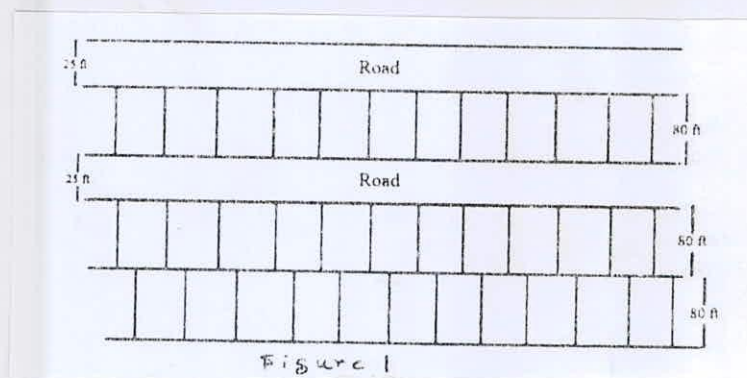
Figure 1

    For subdivision planning, some principles need to be followed to arrange the plots. Take a look at Figure 1. Would you prefer to do plotting in this way? Explain your answer.   (15)

    (c) Differentiate the functions of cesspool and septic tank in a private individual sewerage system.   (8)

    (d) How rectilinear pattern addresses the limitation of gridiron pattern?   (5)

2. (a) Suppose you are assigned to design a residential neighborhood in an area which is topographically undulated. Which layout pattern do you prefer for subdivision planning of this area? Explain your answer.   (10)

    (b) Explain which factors influence the decision whether to store or recharge ground water using harvested rain.   (12)

    (c) How would you differentiate between housing group and neighborhood?   (8)

    (d) Mention the disadvantages of installing individual well in a water supply system.   (5)

3. (a) "Nature of catchment area controls the quantity of harvested water in a rainwater harvesting system" – Explain this statement with example.   (8)

    (b) A residential neighborhood planning project is adopted in a steep sloped area where cul-de-sac will be accommodated in the layout. The length of the cul-de-sac is 1300 ft for which the design of it needs some modifications. How would you modify the design of cul-de-sac in this context?   (10)

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Contd ... Q. No. 3

(c) "Application of FAR and setback in plotting help to plan a neighborhood in an organized way accommodating all necessary facilities" – Explain this statement. (10)

(d) How plotting with row houses and semi-detached houses can reduces the cost in subdivision planning? (7)

4. (a) "In the context of Dhaka, rainwater harvesting can be an effective alternative to meet water demand in near future" – do you agree with this statement? Justify your answer. (12)

(b) Site plans locate objects and activities in 'space' and 'time' – Explain this statement with example(s). (13)

(c) Community segregation of aggregation, which one would you prefer in house grouping? Explain your answer. (10)

SECTION – B

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

5. (a) Give definition of "Site and Area Planning"? List the design steps followed in site and area planning. (15)

(b) What are the objectives of site planning of a shopping centre? Describe the common configurations of site planning for a shopping centre. (20)

6. (a) In the perspective of site and area planning, what are the different ways to control noise? Explain each of them. (20)

(b) Define grading. State the cutting and filling process using a diagram. (15)

7. (a) What do you mean by "industrial district"? Explain the criteria for selecting a site for industrial district? (15)

(b) Illustrate using diagrams, how air movement affects a site. (20)

8. Write short notes on the following topics: (7×5=35)

   (i) Shadow
   (ii) Drainage system
   (iii) Shape of space
   (iv) Sensuous forms
   (v) Heat exchange

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1 BURP Examinations 2020-2021

Sub: **PLAN 291** (Statistics for Planners I)

Full Marks: 210   Time: 3 Hours

USE SEPARATE SCRIPTS FOR EACH SECTION

The figures in the margin indicate full marks

Number of extra item/s included in this manuscript in the form of chart, table, etc.

SECTION – A

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

1. (a) Discuss the characteristics of normal probability distribution with necessary illustrations. **(10)**

    (b) Assume that the answering time for a recruitment exam is a normal random variable with a mean of 80 minutes and standard deviations of 5 minutes. If 93% of the students take less time to answer the questions than a particular student, how much time (approximately) does that particular student take to answer the questions? **(12)**

    (c) Previous exam data reveal that in a competitive exam on average students get 250 marks with a standard deviation of 35 marks. If anyone selects 30 students randomly, what is the probability that the sample average mark is between 240 to 265? **(13)**

2. (a) Distinguish among the events with relevant examples and illustrations: 'Mutually Exclusive', 'Not Mutually Exclusive', 'Collectively Exhaustive', and 'Not Collectively Exhaustive'. **(10)**

    (b) People arrive randomly and independently at a rail station. The mean arrival rate is 20 people per minute. What is the probability of at least three people arriving in a 30-second period? **(13)**

    (c) A recent study claims that 60% of engineering students get their first job within three months from their graduation. Assume that this claim is true. What is the probability that in a random sample of 600 engineering graduate students, less than 57% got a job within three months from their graduation? **(12)**
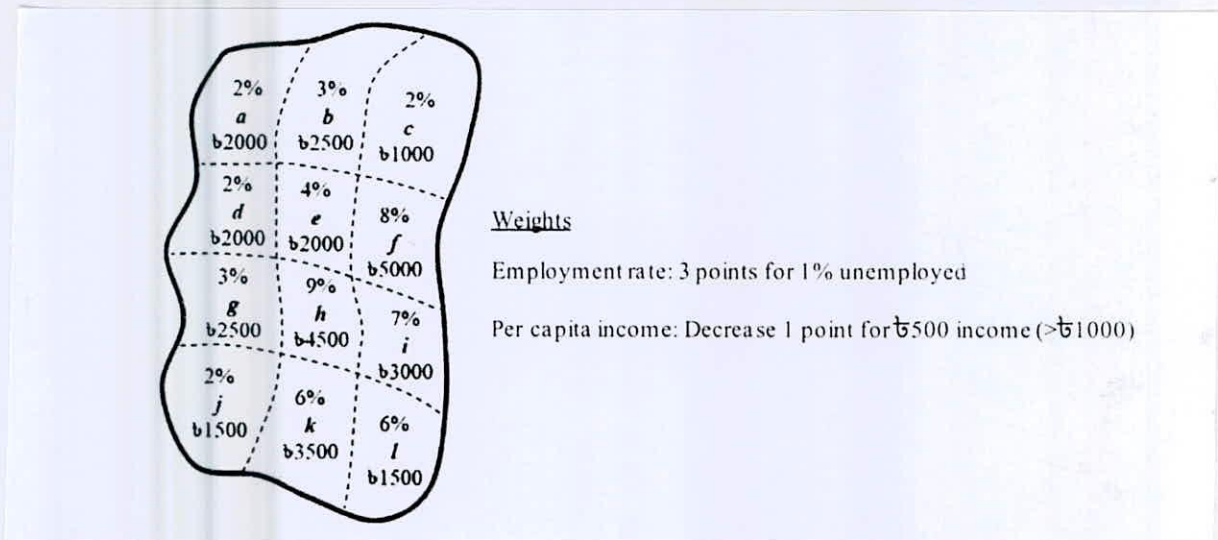
3. (a) There are three main approaches for calculating probability. Briefly explain the approaches with relevant examples. **(10)**

    (b) On average player P, hits 1 out of 4 arrows in the target. In a competition, player P clearly misses the first 2 arrows. What is the probability of hitting at least one arrow in the target in the next 2 attempts? **(10)**

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(c) The following figure shows 12 localities: from a to 1. These localities need to be regionalized based on two criteria: employment rate and per capita income. Calculate the index number for each locality based on the following information and regionalize the localities in high and less developed areas. Index number more than 10 is considered as a less developed area. **(15)**

Weights

Employment rate: 3 points for 1% unemployed

Per capita income: Decrease 1 point for ৳500 income (>৳1000)

4. (a) Discuss the four levels of measurement of data with relevant examples. **(10)**

(b) A printing shop wants to launch a self-printing facility for students. For further decisions, they collected some necessary data from 132 students who visited their shop on a particular weekday. Of these students, 65% agreed that they would be able to print on their own without any operator. The shopkeeper also collected unit printing price data from 25 printing shops. The data produced a mean unit price of Tk. 3.5. It is known that the population standard deviation of a unit printing price is Tk. 1.5, and the population of such prices is normal.

i) Does the sampling have any bias? Justify your answer. **(5)**

ii) Construct a 98% confidence interval of the students agreeing to print on their own without any operator (assume that the sample size is large). **(10)**

iii) Construct a 95% confidence interval for the unit mean price of Tk. 3.5. **(10)**
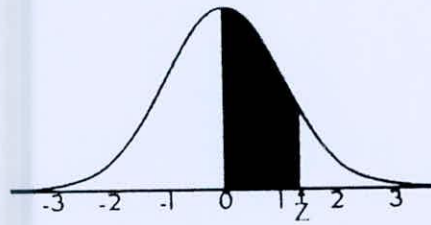
STANDARD NORMAL TABLE (Z)

Entries in the table give the area under the curve between the mean and z standard deviations above the mean. For example, for z = 1.25 the area under the curve between the mean (0) and z is 0.3944.

	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	0.0190	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	0.2969	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	0.3513	0.3554	0.3577	0.3529	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
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998

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SECTION – B

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

5. (a) To understand the travel behavior of the businessman working in Chattagram city, data on travel cost has been collected from 100 of them (Table 1). **(20)**

Table 1: Travel Cost and Frequency of Businessmen Working in Chattagram City

Travel Cost (in BDT)	Travel Frequency
0-200	25
200-400	22
400-600	20
600-800	13
800-1000	20

Comment on whether this data set follows a normal distribution or not

(b) Positive integers l, m, n, o and p are such that $l < m < n < o < p$. If the average of the five numbers is 6 and $o-m = 3$, then what is the lowest possible range of the five integers? **(15)**

6. (a) Suppose, a researcher wants a suitable assistant for her. Therefore, she takes consecutively 8 tests from three applicants and gives scores for the tests accordingly (Table 2). She believes the applicant having greater uniformity in the scores is the most suitable one for this post. Which applicant would be chosen as the assistant by the researcher? **(10)**

Table 2: Scores of the Applicants

Applicant	Score in eight tests
Applicant 1	40, 24, 28, 08, 67, 21, 87, 48
Applicant 2	55, 02, 65, 00, 12, 09, 21, 75
Applicant 3	07, 23, 55, 17, 26, 42, 09, 93

(b) Consider a set of seven positive integers, where the range is 2, average and mode is 10. Mention the third and fifth number in the set if the integers are arranged in descending order. **(10)**

(c) You have collected data for a research purpose. This results are in the following Table 3 showing the distribution of daily travel time (in minutes) for the commuters of Dhaka. **(15)**

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Contd... Q. No. 6(c)

Table 3: Frequency distribution of the daily travel time (in minutes) for the commuters

Travel Time (in minutes)	Number of Commuters
125-133	24
133-141	32
141-149	56
149-157	68
157-165	20

Comment on the skewness of the distribution.

7. (a) Briefly describe the importance of 'OGIVE curve'. (5)

(b) Construct a box-and-whisker plot for the dataset given below and determine whether this dataset contain any outliers. (Table 4) (20)

Table 4: Waiting Time of the Travelers

Waiting Time (in minutes)	Frequency
0-10	5
10-20	6
20-30	32
30-40	80
40-50	15

(c) A set of integers consist of 210, 211, 211, 212, 215, 218 and G. If G increases by 1, the median of the set stays unchanged. If G is decreased by 1, the median of the set also decreases by 1. State the value of G. (10)

8. (a) There is a set of five integers where the average is 7. The average of the three smallest numbers in the set is 6 and the average of the three largest numbers in the set is 8. Determine the difference between the sum of the two largest numbers and the sum of the two smallest numbers. (10)

(b) Write short notes on the following topics (any FIVE) (5×5=25)

    (i) Frequency Polygon

    (ii) Lorenz Curve

    (iii) Moments

    (iv) Bar Chart Vs. Histogram

    (v) Cross-section Data Vs. Time Series Data

    (vi) Continuous Variable Vs. Discrete Variable

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA

L-2/T-1   BURP Examinations 2020-2021

Sub: **HUM 179** (Sociology)

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) Define urban area, urbanization, urbanism and over-urbanization.   **(12)**

      (b) What are the factors that influence a city's growth? Discuss.   **(15)**

      (c) What are the social differences between 'pre-industrial cities' and 'post industrial

      cities'?   **(8)**

2.   (a) 'Everything is connected to everything else'- explain in terms of human ecology.   **(10)**

      (b) Briefly discuss the urban ecological process.   **(10)**

      (c) What are the negative impacts of global warming?   **(15)**

3.   (a) Explain what is meant by deviance, crime, and white collar crime.   **(10)**

      (b) Define juvenile delinquency. What are the causes of juvenile delinquency?   **(15)**

      (c) Briefly discuss the push and pull theories of migration.   **(10)**

4.   Write short notes on any THREE of the following-   **(35)**

      (a) Sources of social change

      (b) Demographic Transition Theory

      (c) 4Rs (Reuse, Reduce, Recycle and Refuse)

      (d) Globalization

SECTION – B

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

5.   (a) What is social inequality? Explain the features of the caste system and the estate

      system of the social stratification.   **(15)**

      (b) What do you understand by social mobility? Discuss the different types of social

      mobility with examples.   **(20)**

HUM 179/URP

6. (a) Explain the main features of sociological imagination. **(15)**

    (b) Briefly discuss the functionalist theoretical perspectives of sociology. **(20)**

7. (a) Summarize the Malthusian population theory in the context of Bangladesh. **(15)**

    (b) Demonstrate the demographic transition theory, and point out the strengths of this theory. **(20)**

8. Write short notes on any three of the following: **(35)**

    (a) Agents of socialization.

    (b) Absolute poverty and relative poverty.

    (c) Social norms and social values.

    (d) Sub-culture, counter culture and ethnocentrism.

BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY, DHAKA
L-2/T-1   BURP Examinations 2020-2021
Sub: **CE 209** (Construction Materials)

Full Marks: 140   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.
Assume reasonable values for missing data, if any.

1.   (a) What is Mineral? Write down the names of principal minerals and some of the
major properties of minerals.   **(6)**

(b) Write down the Geological classification and Mineral based classification of
stones. Describe different types of geological stones including formation process,
notable characteristics and examples.   **(10)**

(c) Briefly explain the influence of compaction and water-cement ratio on compressive
strength of concrete with diagrams.   **(7⅓)**

2.   (a) Write down the general chemical composition of bricks. What are the functions of
following ingredients of bricks?   **(10)**

Alumina, Silica, Magnesia, Lime, Alkalis

(b) Describe the following tests of bricks briefly: **(6)**

Water absorption, Compressive strength, Efflorescence

(c) Briefly describe the steps of manufacturing of bricks and provide brief description
about the classification of bricks.   **(7⅓)**

3.   (a) Describe different types of sands according to source and size of the particles.   **(7⅓)**

(b) Briefly describe the test for silt-clay and organic matter in case of sand.   **(4+6=10)**

Determine the Fineness Modulus (FM) of the sand from the information given in the
following table and comment on the type of sand.

Initial Weight of soil taken = 500 gm		
Sieve no.	Sieve Opening (mm)	Weight of soil retained (gm)
4	4.75	2
6	3.35	8
8	2.36	21
16	1.18	40
20	0.85	35
30	0.6	70
40	0.425	51
50	0.3	60
60	0.25	34
80	0.18	71
100	0.015	50
200	0.075	44
Pan	-	14

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Contd... Q. No. 3

(c) Write down the measures that need to be taken to make concrete durable. Draw schematic diagram of failure modes of concrete cylinders and cubes and comment on those. **(6)**

4. (a) A one storied RCC building is planned to be constructed which consists of 5" thick $20' \times 25'$ rectangular slab and is supported by beams at all of its edges. The beams are 10" wide and 15" deep and supported by 4 columns of cross-section $12'' \times 12''$. If the concrete mix ratio is 1:2:4 (by volume) and water-cement ratio is 0.45 (by weight), calculate the quantity of cement, fine aggregate, coarse aggregate and water required to construct the slab, beams and columns (upto plinth level). Floor to floor height is 10' and assume any reasonable value(s) for missing data. **(10⅓)**

(b) What are the factors that affect workability of concrete? Briefly describe how workability of concrete can be measured with neat sketches. **(7)**

(c) Write short notes on bleeding, segregation and curing of concrete. **(6)**

SECTION – B

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

5. (a) What is 3-Phase diagram for soil? Describe it with schematic diagram. **(5)**

(b) Write short notes on the following topics: **(9)**

    (i)   Bearing Capacity

    (ii)   Atterberg Limit

    (iii) USCS Soil Classification

(c) Write down the functions of foundation and describe different types of foundation with neat sketches. **(9⅓)**

6. (a) What is the difference between 'Timber' and 'Wood'? Mention five characteristics of good timber. **(4)**

(b) Draw a typical X-section of timber identifying its different parts. Write down the advantages of artificial seasoning of timber. **(6)**

(c) Briefly describe different methods for timber preservation. **(5⅓)**

(d) Describe 'defects due to natural forces' and 'defects due to defective seasoning' with neat sketches. **(8)**

CE 209/URP

7. (a) Write short notes on the following properties of materials: **(8)**

    (i)   Elasticity

    (ii) Stiffness

    (iii) Ductility

    (iv) Durability

    (b) What are the differences between cast iron and wrought iron? How can you protect steel from corrosion?   **(3+2=5)**

    (c) Discuss about the advantages and disadvantages of ferrocement its application.   **(5⅓)**

    (d) Briefly describe the principle of Fiber Reinforced Polymer and its application in civil engineering.   **(5)**

8. (a) Briefly describe cement manufacturing process with flow diagram.   **(5)**

    (b) Write down the names of different types of cement and briefly describe the hydration stage of cement with diagram.   **(5⅓)**

    (c) Briefly explain the setting time and consistency test of cement.   **(5)**

    (d) Write down the formula and functions of following compounds: **(8)**

    Alite, Belite, Tetracalcium aluminoferrite, Tricalcium aluminate.