

**Code: 20A141T**

II B.Tech. II Semester Regular Examinations August 2022

**Civil Engineering Drawing**  
(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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**PART-A**

Answer any one questions

Answer any one questions (1 X 28 = 28 Marks)

- Figure shows the line drawing of a residential building, draw to a scale of the following. (a) Dimensional plan (b) Section a long A – A (c) Front elevation.

The following specifications are to be adopted.

Foundation:- Depth 1000 mm. C.C.bed 1000 mm X 300 mm.

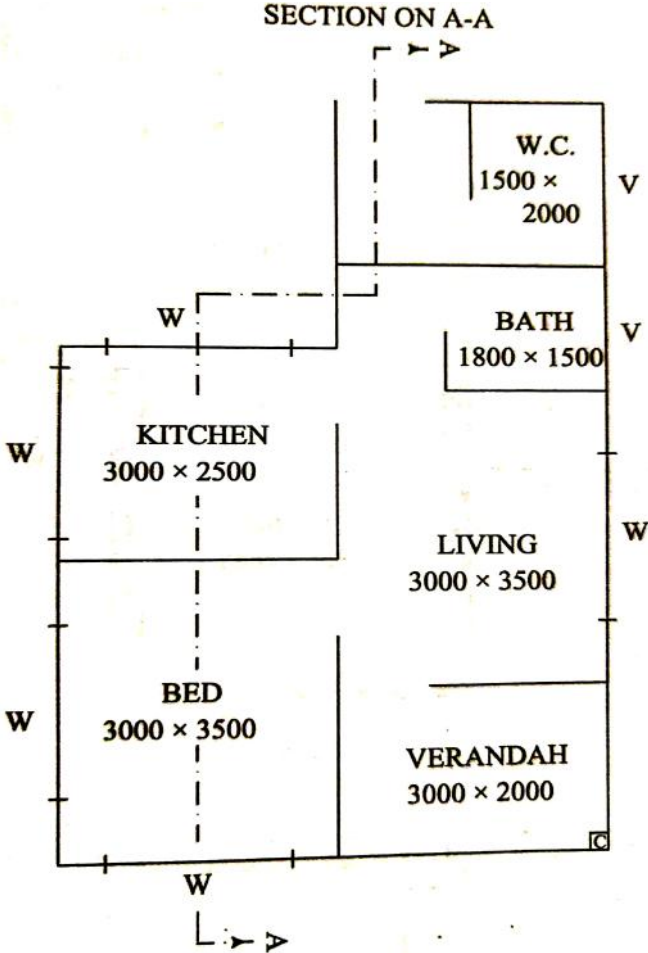
Two footings with an offset of 50 mm and 250 mm thickness each.

Basement: 600mm high, thickness of wall at this level is 400 mm.

Walls: - Brick masonry in C.M. 1:6, 300 mm thick.

Roof:-R.C.C.S lab 120 mm thick.

Provide the details of doors, windows, ventilators, and steps etc as per standard dimensions. Assume any data required. All dimensions are in mm



OR

2. a) Draw the front elevation and sectional plan of a paneled and half glazed door with frame of size 1200mmx2100mm showing the various components.
- b) Give the neat sketches to indicate the conventional signs for the following:
- i) Earth in section      ii) Concrete      iii) Steel
- iv) Stone Masonry      v) Wood Work.

28M    L5

**PART-B**Answer *Three* questions from the following ( 3 x 14 = 42 Marks )

	Marks	CO	Blooms Level
3. a) Discuss the various bye-laws as applied to buildings and indicate their usefulness or otherwise.	7M	2	L2
b) What is the significance of open space around a building? Give various criteria in this regard and mention the dimensions of open-air-space on all four sides for residential buildings.	7M	2	L2
4. a) Which rooms are required for different income groups? Justify your answer	7M	1	L2
b) Discuss the requirements of a residential building to accommodate a family of 6 members.	7M	1	L2
5. a) What are the factors to be considered in the design of a bank building?	7M	3	L4
b) Write short notes on floor area ratio. How is it related to height of the building? Explain.	7M	3	L4
6. a) What are the factors to be considered by planner prior to planning of a residential building? Explain one of them in detail.	7M	2	L2
b) Explain the limitations of building bye-laws.	7M	2	L2
7. Differentiate between the following:			
a) Hotel and Motel			
b) Reading room and Stack room			
c) Auditorium and foyer			
d) Dispensary and Clinic	14M	3	L2

\*\*\* End \*\*\*

Hall Ticket Number :

R-20

Code: 20A143T

II B.Tech. II Semester Regular Examinations August 2022

**Engineering Geology**  
(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. In Part-A, each question carries **Two mark**.  
3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

- | 1. Answer ALL the following short answer questions ( 5 X 2 = 10M ) | CO   | Blooms Level |
|--|------|--------------|
| a) What is weathering?   | CO 1 | L1           |
| b) Explain why do you need to study the minerals?                  | CO 2 | L2           |
| c) Write the common textures in igneous rocks?                     | CO 3 | L1           |
| d) What is an outcrop?   | CO 4 | L1           |
| e) Compare aquifer with aquiclude?                                 | CO 5 | L2           |

**PART-B**

Answer *five* questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

- |   | Marks | CO  | Blooms Level |
|---|-------|-----|--------------|
| <b>UNIT-I</b>   |       |     |              |
| 2. What is the importance of Geology from the Civil engineering point of you? Explain with examples?          | 12M   | CO1 | L1           |
| <b>OR</b>   |       |     |              |
| 3. Outline any two case histories of failures of Civil engineering constructions due to geological drawbacks? | 12M   | CO1 | L2           |
| <b>UNIT-II</b>  |       |     |              |
| 4. How do you identify the minerals using their physical properties? Explain with suitable examples?          | 12M   | CO2 | L2           |
| <b>OR</b>   |       |     |              |
| 5. Explain the physical properties and uses of<br>i) Quartz    ii) Olivine    iii) Muscovite    iv) Calcite   | 12M   | CO2 | L2           |
| <b>UNIT-III</b>   |       |     |              |
| 6. Explain the Geological classification of rocks?  | 12M   | CO3 | L2           |
| <b>OR</b>   |       |     |              |
| 7. What is fold? Describe important types of folds with suitable sketches?                                    | 12M   | CO3 | L1           |
| <b>UNIT-IV</b>  |       |     |              |
| 8. Discuss various geological controls of groundwater movement?   | 12M   | CO4 | L2           |
| <b>OR</b>   |       |     |              |
| 9. What are the causes and effects of earthquakes?  | 12M   | CO4 | L1           |
| <b>UNIT-V</b>   |       |     |              |
| 10. What are the different types of dams? List the Geological considerations in the selection of dam site?    | 12M   | CO5 | L1           |
| <b>OR</b>   |       |     |              |
| 11. What is the purpose of tunneling? Explain the geological considerations in the tunneling?                 | 12M   | CO5 | L2           |

\*\*\* End \*\*\*

Hall Ticket Number :

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**R-20**

**Code: 20A142T**

II B.Tech. II Semester Regular Examinations August 2022

**Materials, Testing and Evaluation**

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. In Part-A, each question carries **Two mark**.

3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

- |   | CO  | Blooms Level |
|---|-----|--------------|
| 1. Answer ALL the following short answer questions ( 5 X 2 = 10M )                          | CO  | Blooms Level |
| a) How does excess of each of the constituents of brick-earth affect the quality of bricks? | CO1 | L2           |
| b) List out the various advantages of hollow concrete block masonry.                        | CO2 | L1           |
| c) How setting time of cement differs from its hardening?                                   | CO3 | L2           |
| d) What are the data to be required in the ACI method of mix design?                        | CO4 | L1           |
| e) What are the application areas of FRC?   | CO5 | L1           |

**PART-B**

Answer *five* questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

- |   | Marks | CO  | Blooms Level |
|---|-------|-----|--------------|
| <b>UNIT-I</b>   |       |     |              |
| 2. Explain in detail about the seasoning of timber with neat sketches.  | 12M   | CO1 | L2           |
| <b>OR</b>   |       |     |              |
| 3. a) Discuss the various methods of manufacturing of bricks.   | 7M    | CO1 | L2           |
| b) Explain the following:<br>(i) Types of tiles (ii) Characteristics of good tiles.   | 5M    | CO1 | L1           |
| <b>UNIT-II</b>  |       |     |              |
| 4. a) What are the various types of foundations?  | 5M    | CO2 | L1           |
| b) Discuss the various types of shallow foundation with neat sketches.  | 7M    | CO2 | L2           |
| <b>OR</b>   |       |     |              |
| 5. a) With neat sketches explain the various types of pitched roofs.  | 7M    | CO2 | L2           |
| b) Brief the construction methodology of cement concrete floor.   | 5M    | CO2 | L2           |
| <b>UNIT-III</b>   |       |     |              |
| 6. List out the various tests employed to measure the workability and explain briefly the slump cone test with neat sketch. | 12M   | CO3 | L2           |
| <b>OR</b>   |       |     |              |
| 7. With neat sketches, briefly describe any three non-destructive tests (NDT) on concrete.                                  | 12M   | CO3 | L2           |

<b>UNIT-IV</b>
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8. Explain the following:
- |                                    |                           |     |        |
|------------------------------------|---------------------------|-----|--------|
| (a) Elastic properties of concrete | (b) Modulus of Elasticity |     |        |
| (c) Dynamic Modulus of Elasticity  | (d) Poisson's ratio       | 12M | CO4 L2 |

**OR**

9. Design a concrete mix design for M30 grade of concrete using IS method with the following data:

**(i) Design stipulations:**

- (a) Characteristic compressive strength required in the field at 28 days grade designation — M 30
- (b) Type of Cement: OPC 53 Grade confirming to IS 12269 (b) Maximum Nominal size of aggregate — 20 mm
- (c) Shape of CA — Angular
- (d) Workability required at site — 100 mm (slump)
- (e) Type of exposure the structure will be subjected to (as defined in IS: 456) — Moderate
- (f) Method of concrete placing: pump able concrete

**(ii) Test data of materials:** The following materials are to be tested in the laboratory and results are to be ascertained for the design mix

- (a) Cement used: OPC 53 Grade Confirming to IS 12269
- (b) Specific Gravity of Cement: 3.15
- (c) Chemical admixture: Super plasticizer confirming to IS 9103
- (d) Specific gravity of Fine Aggregate (sand): 2.70, Specific gravity of Coarse Aggregate: 2.80
- (e) Water Absorption Coarse Aggregate: 0.4% Fine Aggregate: 1.0%
- (f) Free (surface) moisture Coarse Aggregate: Nil, Fine Aggregate: Nil Aggregate are assumed to be in saturated surface dry condition usually while preparing design mix.
- (g) Sieve Analysis Fine aggregates: Confirming to Zone I.

12M CO4 L3

<b>UNIT-V</b>
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10. Describe the advantages and applications of High strength concrete. Compare them with those of conventional concrete.
- 12M CO5 L2

**OR**

11. a) Compare and contrast the important properties of normal concrete with those of polymer concrete.
- 8M CO5 L3
- b) Write a brief note on bacteria concrete.
- 4M CO5 L2

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Hall Ticket Number : 

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**R-20**

**Code: 20AC41T**

II B.Tech. II Semester Regular Examinations August 2022

**Probability and Statistics**

(Common to CE, ME, CSE and AI&DS)

Max. Marks: 70

Time: 3 Hours

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. In Part-A, each question carries **Two mark**.  
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

- 1. Answer ALL the following short answer questions** ( 5 X 2 = 10M )
- |   | CO | Blooms Level |
|---|----|--------------|
| a) The aerokopter AK 1-3 is an ultra-lightweight manned kit helicopter with a high rotor tip speed. A sample of 8 measurements of speed, in meters per second yielded 204, 208, 205, 211, 207, 201, 201, 203. Find the mean and mode for this sample. | 1  | L1           |
| b) State the addition theorem of probability. Explain it if the events are (i) mutually exclusive and (ii) Independent.   | 2  | L1           |
| c) Write the conditions for which binomial distribution can be approximated by Poisson distribution.  | 3  | L1           |
| d) Discuss about the errors that occur in sampling.   | 4  | L1           |
| e) Write the test statistic for the difference between two variances.   | 5  | L1           |

**PART-B**

Answer *five* questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

Marks    CO    Blooms Level

**UNIT-I**

2. Calculate the mean, median and mode for the frequency distribution given below:

Height (nm)	205-245	245-285	285-325	325-365	365-405	Total
Frequency	3	11	23	9	4	50

12M    1    L2

**OR**

3. a) Find Karl Pearson's coefficient of correlation between sales and expenses of the following 10 firms:

Firm	1	2	3	4	5	6	7	8	9	10
Sales	50	50	55	60	65	65	65	60	60	50
Expenses	11	13	14	16	16	15	15	14	13	13

6M    1    L3

- b) Calculate Spearman's rank correlation coefficient between advertisement cost and sales from the following data:

Advertisement cost ('000 Rs)	39	65	62	90	82	75	25	98	36	78
Sales (Lakhs)	47	53	58	86	62	68	60	91	51	84

6M    1    L3

**UNIT-II**

4. a) Two cards are drawn at random from an ordinary deck of 52 cards. What is the probability of getting two aces if  
 (i) the first card is replaced before the second card is drawn;  
 (ii) the first card is not replaced before the second card is drawn?
- b) State and prove Baye's theorem.

6M    2    L3

6M    2    L2

**OR**

5. A random variables X has the following probability function:

x	0	1	2	3	4	5	6	7
P(x)	0	K	2K	2K	3K	K <sup>2</sup>	2K <sup>2</sup>	7K <sup>2</sup> +K

Determine: (i) K (ii) Evaluate  $P(X < 6)$  (iii) Evaluate  $P(0 < X < 5)$  (iv) mean and variance

12 C02 L5

**UNIT-III**

6. a) Fit a binomial distribution to the following data:

x:	0	1	2	3	4	5
f:	10	10	30	25	15	10

6M 3 L3

- b) Given a random variable having the normal distribution with mean 16.2 and variance 1.5625, find the probabilities that it will take on a value (i) greater than 16.8, (ii) between 13.6 and 18.8.

6M 3 L3

**OR**

7. a) If a random variable X follows Poisson distribution such that  $P(X = 1) = P(X = 2)$ , find (i) the mean and variance of the distribution (ii)  $P(X = 0)$ .

6M 3 L3

- b) An automatic machine fills distilled water in 500 ml bottles. Actual volumes are normally distributed about a mean of 500 ml, and standard deviation 20ml.

(i) What proportion of the bottles are filled with water outside the tolerance limit of 475 ml to 525 ml?

(ii) To what value does the standard deviation need to be adjusted if 99% of the bottles must be within tolerance limits?

6M 3 L3

**UNIT-IV**

8. a) A random sample of size 100 is taken from a population with standard deviation 5.1. Given that the sample mean is 21.3, construct a (i) 95% (ii) 98% confidence interval for the population mean.

8M 4 L3

- b) Write the procedure in testing the hypothesis.

4M 4 L1

**OR**

9. a) Suppose that we want to estimate the true proportion of defectives in a very large shipment of adobe bricks, and that we want to be at least 95% confidence that the error is at most 0.04. How large a sample will we need if (i) we have no idea what the true proportion might be;

(ii) we know that the true proportion doesn't exceed 0.12?

6M 4 L3

- b) To test the claim that the resistance of electric wire can be reduced by more than 0.050 ohm by alloying, 32 values obtained for standard wire yielded mean of 0.136 ohm and standard deviation 0.004 ohm, and another 32 values obtained for alloyed wire yielded mean 0.083 ohm and standard deviation 0.005 ohm. At 0.05 level of significance, does this support the claim?

6M 4 L3

**UNIT-V**

10. Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. Test whether the two horses have the same running capacity?

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	--

12M 5 L3

**OR**

11. From the following data find whether there is any significant liking in the habit of taking soft drinks among the categories of the employees.

Soft drinks	Clerks	Teachers	Officers
Pepsi	10	25	65
Thumsup	15	30	65
Fanta	50	60	30

12 5 L1

\*\*\* End \*\*\*

Hall Ticket Number :

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**R-20**

**Code: 20A144T**

II B.Tech. II Semester Regular Examinations August 2022

**Structural Analysis**

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. In Part-A, each question carries **Two mark**.  
3. Answer **ALL** the questions in **Part-A** and **Part-B**

**PART-A**

(Compulsory question)

1. **Answer ALL the following short answer questions** (5 X 2 = 10M )
- What are the disadvantages of a fixed beam?
  - Mention the effect of settlement of supports in a continuous beam.
  - What is the limitation of slope-deflection equations applied in structural analysis?
  - Identify the practical use of Influence line diagrams. Give examples.
  - Define Static and Kinematic indeterminacy with example.

**PART-B**

Answer *five* questions by choosing one question from each unit ( 5 x 12 = 60 Marks )

**UNIT-I**

2. A fixed beam AB of length 5m is having  $I = 3 \times 10^6 \text{ mm}^4$  carries eccentric point load of 8kN at a distance of 2 m from left end. The support B sinks down by 3mm. Determine fixed end moments at A and B. Draw SFD and BMD.

**OR**

3. A fixed beam AB of span 6 m carries uniformly varying load of intensity zero at A and 20 kN/m at B. Find the fixed end moments and draw the B.M. and S.F. diagrams for the beam. Also calculate maximum deflection.

**UNIT-II**

4. Using the theorem of three moments draw the shear force and bending moment diagrams for a three continuous beam of span 24 m, divided equally. First and third spans carry udl of 4 kN/m and 6 kN/m respectively. The second span of the beam has central point load of 8 kN. Analyse the beam.

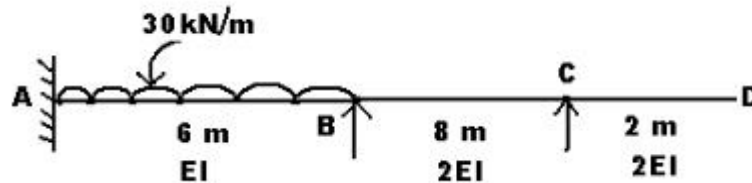
**OR**



5. A continuous beam ABC covers two consecutive spans AB and BC of lengths 4 m and 6 m carrying uniformly distributed loads of 60 kN/m and 100 kN/m respectively. If the ends A is fixed and end C is simply supported, analyse the beam. Draw also B.M. and S.F. diagrams, using method of three moments.

### UNIT-III

6. Using slope deflection method, analyze the beam shown in Fig. and draw the BMD.



OR

7. A simply supported beam ABC is continuous over two spans AB and BC of 7m and 8m respectively. Span AB is carrying a uniformly distributed load of 5kN/m and span BC carries point load of 8 kN at midpoint of BC. Find the support moment at B, if EI of the beam is constant. Use moment distribution method.

### UNIT-IV

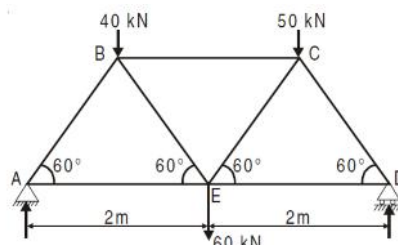
8. Draw the ILD for shear force and bending moment for a section at 50m from the left hand support of a simply supported beam, 200m long. Also calculate the maximum bending moment and shear force at the section due to an uniformly distributed rolling load of length 80m and intensity 100kN/m.

OR

9. In a simply supported girder AB of Span 25 m, determine the maximum bending moment and maximum shear force at a section 8 m from A, due to the passage of a uniformly distributed load of intensity 24 kN/m, longer than the span

### UNIT-V

10. Determine the forces in all the members of the truss shown in Fig. and indicate the magnitude and nature of forces on the diagram of the truss.



OR

11. State and prove the Castigliano's second Theorem

\*\*\* End \*\*\*