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<b>R-20</b>
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**Code: 20A143T**

II B.Tech. II Semester Supplementary Examinations December 2023

## **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 marks**.  
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  | BL |
| a) What is Structural Geology?                     |                 | CO1 | L4 |
| b) Define Mineral.                                 |                 | CO2 | L3 |
| c) How Igneous Rocks are formed?                   |                 | CO3 | L4 |
| d) What is Storativity?                            |                 | CO4 | L4 |
| e) What is tunnel?                                 |                 | CO5 | L3 |

### **PART-B**

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

- |  | Marks | CO  | BL |
|--|-------|-----|----|
| <b>UNIT-I</b>  |       |     |    |
| 2. a) What is Physical Geology? Discuss importance of Physical Geology in Civil Engineering. | 6M    | COI | L3 |
| b) Discuss the Geological drawbacks in Civil Engineering.                                    | 6M    | COI | L3 |
| <b>OR</b>  |       |     |    |
| 3. a) Discuss the effect of Rock weathering.   | 6M    | COI | L3 |
| b) Explain the effect of weathering in Reservoir construction.                               | 6M    | COI | L3 |
| <b>UNIT-II</b>   |       |     |    |
| 4. a) What is Mineral? Explain physical properties of Minerals.                              | 6M    | CO2 | L4 |
| b) Explain uses of Minerals - i) Quartz ii) Haematite iii)Talc.                              | 6M    | CO2 | L3 |
| <b>OR</b>  |       |     |    |
| 5. a) Explain the process Crystallization of Magma in Mineral formation.                     | 8M    | CO2 | L4 |
| b) Write a note on Habbit of Mineral.  | 4M    | CO2 | L4 |
| <b>UNIT-III</b>  |       |     |    |
| 6. a) What is Rock? Explain Rock cycle.  | 5M    | CO3 | L3 |
| b) Enumerate Concordant and Discordant forms of Igneous Rock.                                | 7M    | CO3 | L3 |

**OR**

7. a) What is an Outcrop? Explain Dip and Strike. 6M CO3 L3  
 b) Explain Soil Profile with neat Sketch. 6M CO3 L4

**UNIT-IV**

8. a) Explain Geophysical method of Groundwater exploration. 7M CO4 L3  
 b) Discuss Hydrological properties of Rock. 5M CO4 L4

**OR**

9. a) Discuss causes and effects of Earthquake. 8M CO4 L4  
 b) Explain Specific Yield and Specific Retention and define the relation with Porosity. 4M CO4 L4

**UNIT-V**

10. a) What is Dam? Explain types of Dams. 6M CO5 L4  
 b) Discuss the factors considered at the time of selection of Reservoir site. 6M CO5 L4

**OR**

11. a) Discuss the feasibility of Tunnel in deformed rock formation. 7M CO5 L4  
 b) Explain the feasibility of Dam site in Folded and Faulted region 5M CO5 L4

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

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**R-20**

**Code: 20A142T**

II B.Tech. II Semester Supplementary Examinations December 2023

## **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 marks**.  
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  | BL |
|---|-----|----|
| a) Write the properties of building stone.                | CO1 | L1 |
| b) Draw neat sketch of king post and Queen post trusses.  | CO2 | L1 |
| c) Compare fresh and hardened concrete.                   | CO3 | L3 |
| d) List the factors influencing creep.                    | CO4 | L1 |
| e) Define Bacterial concrete and list any 2 applications. | CO5 | L2 |

### **PART-B**

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

Marks CO BL

#### **UNIT-I**

- |  |    |     |    |
|--|----|-----|----|
| 2. a) Enumerate the properties of building stones. | 6M | CO1 | L2 |
| b) Explain the composition of good brick earth.    | 6M | CO1 | L1 |

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 3. a) Write various types of woods used in building. | 6M | CO1 | L2 |
| b) Describe dressing of stone and its importance.    | 6M | CO1 | L1 |

#### **UNIT-II**

- |  |    |     |    |
|--|----|-----|----|
| 4. a) Differentiate Rubble and Ashlar masonry. Draw neat sketch. | 6M | CO2 | L3 |
| b) Enumerate any two types of staircase with neat sketch.        | 6M | CO2 | L2 |

**OR**

- |  |    |     |    |
|--|----|-----|----|
| 5. a) Compare the usage of lean- to- roof and coupled roof with neat sketches. | 6M | CO2 | L3 |
| b) Explain different types of lintels.   | 6M | CO2 | L2 |

#### **UNIT-III**

- |   |    |     |    |
|---|----|-----|----|
| 6. a) Explain any two tests to find the properties of cement with its significance. | 6M | CO3 | L2 |
|---|----|-----|----|

- b) Compare destructive and non-destructive testing of concrete. 6M CO3 L3

**OR**

7. a) Enumerate Abram's Law. 6M CO3 L2  
b) Explain chemical composition of cement. 6M CO3 L1

**UNIT-IV**

8. a) Define Dynamic modulus of elasticity. Explain its significance. 6M CO4 L1  
b) Explain the importance of durability test in concrete. 6M CO4 L2

**OR**

9. a) Enumerate quality control of concrete. 6M CO4 L1  
b) List and explain types of shrinkage. 6M CO4 L1

**UNIT-V**

10. a) Differentiate cellular concrete and No fines concrete. 6M CO5 L3  
b) Enumerate different types of fibers used in Fiber Reinforced Concrete. 6M CO5 L2

**OR**

11. a) Compare High density concrete and high performance concrete. 6M CO5 L3  
b) Enumerate different types of Polymer concrete. 6M CO5 L2

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

Hall Ticket Number :

R-20

Code: 20AC41T

II B.Tech. II Semester Supplementary Examinations December 2023

**Probability and Statistics**

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

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 marks**.  
 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 BL
- a) Define Correlation between two variables. Also write the formula for Karl Pearson's coefficient of correlation. CO1 L1
- b) Two dice are thrown. Let A be the event that the sum of the points on the faces is 9. Let B be the event that at least one number is 6. Find (i)  $P(A \cap B)$  (ii)  $P(A \cup B)$  CO2 L3
- c) What is Binomial distribution function? Write the formulae for mean and variance of Binomial distribution. CO3 L1
- d) A random sample of size 100 has a standard deviation of 5. what can you say about the maximum error of estimate with 95% confidence? CO4 L3
- e) For F -distribution, find  $F_{0.05}$  with  $v_1 = 7$  and  $v_2 = 15$  CO5 L3

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

Marks CO BL

**UNIT-I**

2. Find mean, median and mode for the following data:

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	8	7	12	28	20	10	10

12M CO1 L3

**OR**

3. From the following data calculate the rank correlation coefficient

X	48	33	40	9	16	16	65	24	16	57
Y	13	13	24	6	15	4	20	9	6	19

12M CO1 L3

**UNIT-II**

4. Suppose a continuous random variable X has the probability density function
- $f(x) = K(1-x^2)$
- for
- $0 < x < 1$
- , and
- $f(x) = 0$
- otherwise.

Find (i) K (ii) Mean (iii) Variance

12M CO2 L3

**OR**

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

X	1	2	3	4	5	6	7	8
P(X)	K	2K	3K	4K	5K	6K	7K	8K

Find the value of (i) K (ii) Mean (iii) Variance

12M CO2 L3

<b>UNIT-III</b>
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6. Seven coins are tossed and the number of heads are noted. The experiment is repeated 128 times and the following distribution is obtained.

No .of heads	0	1	2	3	4	5	6	7
Frequency	7	6	19	35	30	23	7	1

Fit a binomial distribution assuming that coin is unbiased

12M CO3 L3

**OR**

7. The marks obtained in mathematics by 1000 students is normally distributed with mean 78% and standard deviation 11%. Determine
- How many students got marks above 90%
  - What was the highest mark obtained by lowest 10 % of the students
  - Within what limits did the middle of 90% of the students lie

12M CO3 L3

<b>UNIT-IV</b>
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8. a) A researcher wants to know the intelligence of students in a school. He selected two groups of students. In the first group there are 150 students having mean IQ of 75 with Standard deviation of 15. In the second group there are 250 students having mean IQ of 70 with Standard deviation of 20. test whether there is any significant difference in the two groups by considering 1% level of significance.
- b) In a big city 325 men out of 600 men were found to be smokers. Does this information support the conclusion that majority of men in this city are smokers? level of significance 5%

8M CO4 L4

4M CO4 L4

**OR**

9. Before an increase on excise duty on tea 500 people out of a sample of 900 found to have the habit of having tea. After an increase on excise duty 250 are found to have tea habit among 1100. Is there any decrease in the consumption of tea? Test at 5% level of significance.

12M CO4 L4

<b>UNIT-V</b>
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10. Scores obtained in a shooting competition by 10 soldiers before and after intensive training are given below:

Before	67	24	57	55	63	54	56	68	33	43
After	70	38	58	58	56	67	68	75	42	38

Test whether the intensive training is useful at 0.05 level of significance

12M CO5 L4

**OR**

11. Two researchers adopted different sampling techniques while investigating some group of students to find the number of students falling into different intelligence level. The results are as follows:

Researcher	Below Average	Average	Above Average	Genius
X	86	60	44	10
Y	40	33	25	2

Would you say that the sampling techniques adopted by two researchers are significantly different? Level of significance 5%

12M CO5 L4

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

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<b>R-20</b>
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**Code: 20A144T**

II B.Tech. II Semester Supplementary Examinations December 2023

## **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 marks**.  
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  | BL |
|--|-----|----|
| a) How to find out the prop reaction of a propped beam?  | CO1 | L1 |
| b) How can you differentiate the support moments of a continuous beam when its ends are overhanging? | CO2 | L1 |
| c) Differentiate between absolute stiffness and relative stiffness.                                  | CO3 | L1 |
| d) Define absolute maximum shear force and absolute maximum bending moment.                          | CO4 | L1 |
| e) Differentiate between internal indeterminacy and external indeterminacy.                          | CO5 | L1 |

### **PART-B**

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

Marks CO BL

#### **UNIT-I**

2. A fixed beam of 4 m span is carrying a u.d.l. of 10 kN/m over the entire span and a point load of 10 kN at the mid span. Draw the shear force and bending moment diagrams and find the maximum deflection, if  $EI=2500 \text{ kNm}^2$
- 12M CO1 L3

**OR**

3. A cantilever of length 4 m carries a u.d.l. of 3 kN/m over its entire length. The cantilever is propped at a distance 3 m from fixed end. Find the reaction at the prop?
- 12M CO1 L3

#### **UNIT-II**

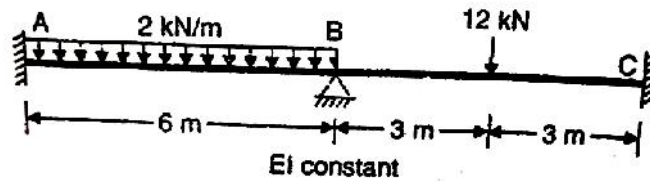
4. State and prove the Clapeyron's theorem of three moments.
- 12M CO2 L3

**OR**

5. Draw the shear force and bending moment diagrams of a continuous beam ABC having span lengths  $AB=4 \text{ m}$  and  $BC=4 \text{ m}$ . The span AB is carrying a point load of 20 kN at a distance of 1m from support A. The span BC carries a u.d.l. of intensity 8 kN/m.
- 12M CO2 L3

### UNIT-III

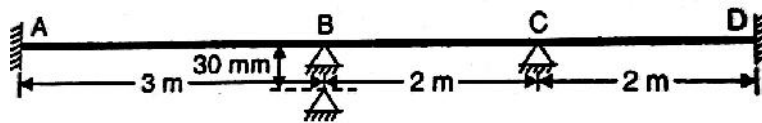
6. A beam ABC, 12 m long, fixed at A and C and continuous over support B is loaded as shown in figure below. Calculate the end moments and plot the bending moment diagram?



12M CO3 L3

**OR**

7. A continuous beam ABC is shown in figure below. Calculate the moments induced at the ends if support B settles by 30 mm? Draw the bending moment diagram and the deflected shape of the beam. Take  $E=2 \times 10^6 \text{ mm}^4$  constant for the whole beam.



12M CO3 L3

### UNIT-IV

8. A beam has a span of 20 m. Draw the influence line for bending moment and shear force for a section 8 m from the left hand support and determine the maximum bending moment and shear force for this section due to two point loads of 8 and 4 kN at a fixed distance of 2 m apart rolling from left to right with either of the loads leading?

12M CO4 L3

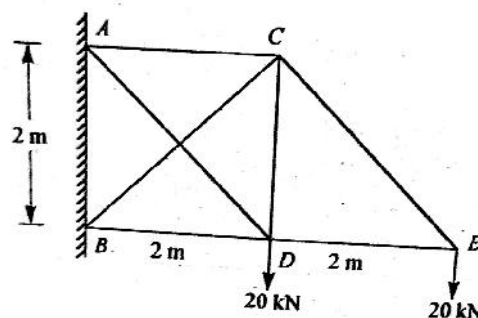
**OR**

9. Two point loads of 4 kN and 6 kN spaced 6 m apart cross a girder of 16 m span, the 4 kN load leading from left to right. Construct the maximum shear force and bending moment diagrams, stating the absolute maximum values.

12M CO4 L3

### UNIT-V

10. Find the forces in the members of the redundant frame shown in figure below under the action of the forces shown? Cross-sectional area of each bar is  $1000 \text{ mm}^2$  and  $E=2 \times 10^5 \text{ N/mm}^2$ .



12M CO5 L3

**OR**

11. State and prove the second theorem of Castigliano.

12M CO5 L3

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