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R-20

Code: 20A142T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

Materials, Testing and Evaluation

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

- 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. The Answer ALL the following short answer questions | (5 X 2 = 10M) | CO | Blooms Level |
|--|-----------------|-----|--------------|
| a) Enumerate the harmful ingredients of brick earth? | | CO1 | L2 |
| b) What is meant by Bond in brick masonry? | | CO2 | L1 |
| c) Illustrate the factors affecting proportioning of concrete mixes. | | CO3 | L2 |
| d) Define the term creep? How do you measure the creep in cement concrete? | | CO4 | L1 |
| e) What are the factors which control the performance of HPC? | | CO5 | 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. Enumerate the qualities and uses of good bricks. | 12M | CO1 | L2 | |
| OR | | | | |
| 3. What are the requirements of a stone which is to be used as a building material? | 12M | CO1 | L2 | |
| UNIT-II | | | | |
| 4. a) With the aid of neat sketches, discuss the method of constructing terrazzo flooring. | 7M | CO2 | L2 | |
| b) Write a brief note on needle scaffolding. | 5M | CO2 | L1 | |
| OR | | | | L2 |
| 5. a) Discuss the method of three-coat lime plaster. | 6M | CO2 | | |
| b) Discuss in detail the different types of damp proofing. | 6M | CO2 | L2 | |
| UNIT-III | | | | |
| 6. a) List the various tests conducted on aggregates indicating the property being tested. | 7M | CO3 | | |
| b) Describe any four types of cements, specifying the applications of each. | 5M | CO3 | L2 | |

OR

7. Explain with neat sketch of any three tests for fresh concrete properties. 12M CO3 L2

UNIT-IV

8. a). List the various data display methods used in quality assessment. 6M CO4 L1
- b). Briefly explain the following:
- (i) Factors affecting creep
- (ii) Structural effects of creep 6M CO4 L2

OR

9. Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete (characteristic strength) is 30 MPa at 28 days measured on standard cylinders. Standard deviation can be taken as 4 MPa. The specific gravity of FA and CA are 2.65 and 2.7 respectively. The dry rodded bulk density of CA is 1600 kg/m³, and fineness modulus of FA is 2.80. Ordinary Portland cement (Type I) will be used. A slump of 50 mm is necessary. CA is found to be absorptive to the extent of 1% and free surface moisture in sand is found to be 2%. Assume any other essential data. Assume 5% of results are allowed to fall below specific design strength. Adopt ACI method. 12M CO4 L3

UNIT-V

10. Write a brief note on the following:
- (a) Light weight aggregate and light weight concrete
- (b) Polymer impregnated concrete 12M CO5 L2

OR

11. Explain the following:
- (a) High strength concrete
- (b) Fibre reinforced concrete 12M CO5 L2

*** End ***

Code: 20AC41T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

Probability and Statistics

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

Max. Marks: 70

Time: 3 Hours

- 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) An engineering group receives e-mail requests for technical information from sales and service. The daily numbers of e0mails for six days are 11, 9, 17, 19, 4, 5. Find the mean and median. | 1 | L1 |
| b) Write the axioms of probability. | 2 | L1 |
| c) Define Poisson distribution and state its constants. | 3 | L1 |
| d) Discuss about one tail and two tail tests. | 4 | L1 |
| e) Write the test statistic of paired sample test. | 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. Find the value of mean, mode and median from the data given below:

Weight (kg)	93-97	98-102	103-107	108-112	113-117	118-122	123-127	128-132
Number of students	3	5	12	17	14	6	3	1

12M 1 L2

OR

3. a) Calculate the Karl Person's coefficient of correlation for the following ages (in years) of husbands and wives at the time of their marriage:

Age of Husband	23	27	28	28	28	30	30	33	35	38
Age of wife	18	20	22	27	21	29	27	29	28	29

6M 1 L3

- b) A test in statistics was taken by 7 students. The teacher ranked his pupils according to their academic achievement. The order of achievement from high to low, together with family income for each pupil, is given as follows:

Name	Rama	Krishna	Siva	Lava	Achyuta	Para	Pragni
Income (Rs '000)	8.7	4.2	5.7	8.2	20	18	17.5

6M 1 L3

UNIT-II

4. a) Define a discrete random variable and its probability distribution function. 6M 2 L3
 b) If the probability density of a random variable is given by

$$f(x) = \begin{cases} x & \text{for } 0 < x < 1 \\ 2-x & \text{for } 1 \leq x < 2 \\ 0 & \text{elsewhere} \end{cases}$$

, find the probabilities that a random variable having

this probability density will take on a value

- (i) between 0.45 and 0.75 (ii) less than 0.6 (iii) greater than 1.0

6M 2 L3

OR

5. a) Given $P(A) = 0.30, P(B) = 0.62, P(A \cap B) = 0.12$, find
 (i) $P(A \cup B)$ (ii) $P(\bar{A} \cap B)$ (iii) $P(A \cap \bar{B})$ (iv) $P(\bar{A} \cup \bar{B})$

4M 2 L2

- b) In a bolt factory, machines A, B, C manufacture respectively 25%, 35% and 40% of the total. Of their output 5%, 4%, 2% are known to be defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine A? 8M 2 L3

UNIT-III

6. a) If a coin is tossed 12 times, find the probability of getting
 (i) at least two heads, (ii) at most 3 heads,
 (iii) between 5 to 8 heads and (iv) all heads. 6M 3 L3
- b) The daily high temperature in a computer server room at the university can modeled by a normal distribution with mean 68.7 °F and standard deviation 1.2 °F. Find the probability that, on any given day, the high temperature will be
 (i) between 68.3 and 70.3 °F , (ii) greater than 71.5 °F. 6M 3 L3

OR

7. a) Fit a Poisson distribution to the following data:

Number of deaths	0	1	2	3	4
Frequencies	122	60	15	2	1

6M 3 L3

- b) Find the probabilities that a random variable having the standard normal distribution will take on a value
 (i) Between 0.87 and 1.28, (ii) between - 0.34 and 0.62,
 (iii) Greater than -0.65 and (iv) less than -0.43 and greater than 0.43. 6M 3 L3

UNIT-IV

8. a) Define the following;
 (I) Point estimation (ii) Interval estimation
 (iii) Unbiased estimator (iv) More efficient unbiased estimator
 (v) Null hypothesis and (vi) Alternative Hypothesis. 6M 4 L1
- b) The breaking strength of ropes produced by a manufacturer have mean 1800N and variance 1000N. By a new technique in the manufacturing process, it is claimed that the breaking strength can be increased. To test this claim a sample of 50 ropes is tested and found that the mean breaking strength is 1850N. Can we support the claim at (i) 0.05 and (ii) 0.01, level of significance? 6M 4 L3

OR

9. a) Discuss about the possible errors that are being occurred in sampling. 4M 4 L3
- b) A cigarette manufacturing firm claims that its brand A line of cigarettes outsells its brand B by 8%. If it is found that 42 out of a sample of 200 smokers prefer brand A and 18 out of another sample of 100 smokers prefer brand B, test whether the 8% difference is a valid claim. 8M 4 L3

UNIT-V

10. To reduce the amount of recycled construction materials entering land fill, it is crushed for use in the base of roadways. Green engineering practices require that their strength, resiliency modulus, be accessed. Measurements on 6 specimens of recycled materials from two different locations produced the data:

Location-I	707	632	604	652	669	674
Location-II	552	554	484	630	648	610

Use the 0.05 level of significance to establish a difference in mean strength for the materials from two locations. Also construct a 99% confidence interval for the difference between means. 12M 5 L3

OR

11. Fit a Poisson distribution to the following data and test for goodness of fit at 0.05 level of significance.

x:	0	1	2	3	4
f:	419	352	154	56	19

12M 5 L3

*** End ***

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R-20

Code: 20A144T

II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

Structural Analysis

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

- 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)

- Differentiate the statically determinate structures and statically indeterminate structures?
- What are the advantages of Continuous beam over simply supported beam?
- What are the assumptions made in slope-deflection method?
- Define Influence lines and its importance in practical application.
- Mention in which cases, Castiglione's theorem can be used.

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 10m carries point load of 180 kN and 150 kN at a distance of 3m and 5m from the left end A. Find the fixed end moments and the reactions at the supports. Draw B.M and S.F diagrams.

OR

3. Find the fixing moments and support reactions of a fixed beam AB of length 8m, carrying a uniformly distributed load of 6kN/m over the left half of the span. Also calculate maximum deflection.

UNIT-II

4. A continuous beam ABC covers two consecutive span AB and BC of lengths 5m and 7m, carrying uniformly distributed loads of 8kN/m and 12kN/m respectively. If the ends A and C are simply supported, find the support moments at A,B and C. draw also B.M.D and S.F.D.

OR

5. A continuous beam ABCD of length 15m rests on four supports covering 3 equal spans and carries a uniformly distributed load of 3 kN/m length. Calculate the moments and reactions at the supports. Draw The S.F.D and B.M.D.

UNIT-III

6. A continuous beam ABC consists of spans AB and BC of 6 m length in each. Both ends of the beam are fixed. The span AB carries a point load of 20 kN at its middle point. The span BC carries a point load of 25 kN at its middle point. Find the moments and reactions at the supports. Assume the beam is of uniform section. Use slope deflection method.

OR

7. A simply supported beam ABC is continuous over two spans AB and BC of 6m and 5m respectively. Span AB is carrying a uniformly distributed load of 4 kN/m and span BC carries point load of 8 kN at a distance of 2m from B. Find the support moment at B if EI of the beam is constant. Use moment distribution method.

UNIT-IV

8. Two wheel loads of 12 kN and 6 kN at a fixed distance apart of 2m, cross a beam of 12m span, Draw the influence line for bending moment and shear force for a point 5m from the left support, and also determine the maximum bending moment and shear force at that point.

OR

9. A UDL of length of 8 m and intensity 25 kN/m moves across a simple beam of span 20 m. Determine the maximum negative and positive shear force at sections 5 m from left support and 6 m from right support. Also find the absolute maximum bending moment that may occur anywhere in the girder

UNIT-V

10. A beam AB of span 4 mts fixed at both the ends and carries a point load of 12 kN at C distant 2 m from A. M.I. of the portion AC of the beam is $2I$ and that of portion CB is I . Use Castigliano's theorem and calculate the fixed end moments and reactions.

OR

11. a) Calculate the central deflection and slope at the ends of a simply supported beam carrying UDL of intensity w/m throughout the span. Use Castigliano's first theorem.
b) Differentiate Static and Kinematic indeterminacies.

*** End ***

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II B.Tech. II Semester Supplementary Examinations Dec 2022 / Jan 2023

Engineering Geology

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

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) Define geological agent?	CO 1	L2
b) Explain what is cleavage? How it helps in the identification of minerals?	CO 2	L2
c) Can you list the structures in igneous rocks?	CO 3	L1
d) Define strike and dip?	CO 4	L1
e) What is storativity?	CO 5	L2

PART-B

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

	Marks	CO	Blooms Level
UNIT-I			
2. Explain the importance of physical geology and structural geology?	12M	CO1	L2
OR			
3. What is weathering? How does it effects on rocks? Explain its impact on reservoirs?	12M	CO1	L1
UNIT-II			
4. Explain various methods available for the study of minerals with their advantages and disadvantages?	12M	CO2	L2
OR			
5. List the properties and uses of i) feldspar ii) Biotite iii) Asbestos iv) Kyanite	12M	CO2	L1
UNIT-III			
6. What is fault? Explain the types of faults with neat sketches?	12M	CO3	L2
OR			
7. Explain the properties and uses of i) Granite ii) Sandstone iii) Basalt iv) Schist	12M	CO3	L2
UNIT-IV			
8. Explain i) Aquifer ii) Aquitard iii) Aquifuse iv) Permeability	12M	CO4	L2
OR			
9. Explain the causes of Landslides? Also discuss the mitigations measures to prevent landslides?	12M	CO4	L2
UNIT-V			
10. Demonstrate the geological considerations in the selection of a dam site?	12M	CO5	L2
OR			
11. Explain i) Purpose tunneling ii) Over break iii) Lining of tunnels iv) Effects of tunneling on ground	12M	CO5	L2

*** End ***