R-19

Code: 19A152T

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Soil Mechanics

(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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		Marks	CO	BL

UNIT–I

1. a) Describe the procedure to determine field dry density of soil by core cutter. — 7M, 1, 2

   b) A compacted cylindrical specimen 50 mm diameter 100 mm length is to be prepared from oven dry soil. If the specimen is required to have a water content of 15% and percentage air voids of 20%. Calculate mass of a soil and water required for the preparation of the sample. Take G=2.69. — 7M, 1, 3

OR

2. a) Write short notes on the method of determination of shrinkage limit of soil. — 7M, 1, 1

   b) A soil has liquid limit and plastic limit of 47% and 33% respectively. If the volumetric shrinkages at the LL and PL are 44% and 29%. Determine the shrinkage limit. — 7M, 1, 3

UNIT–II

3. Describe with a neat sketch how you will determine the coefficient of permeability of a clay sample in the laboratory and derive expression. — 14M, 2, 2

OR

4. a) Explain the properties and practical applications of flow net. — 7M, 2, 1

   b) Determine the seepage discharge through the foundation of an earth dam if the flow net has 10 equipotential drops and 3.5 flow channels. The length of the dam is 300 m and the coefficient of permeability of the soil is 2.5×10^{-14} cm/s. The level of water above the base of the dam 12 m on U/s and 4 m on D/s. — 7M, 2, 3

UNIT–III

5. a) Derive an expression for the vertical stress at any point due to point load. — 7M, 3, 2

b) A water tank is supported by the ring foundation having outer diameter of 10 m and inner diameter of 7.5 m. The ring foundation transmits uniform load intensity of 160 kN/m². Compute the vertical stress at a depth of 4m and 7m, below the centre of ring foundation using Boussinesq's analysis.   7M   3   3

OR

6. a) Write the assumptions in Boussinesq's theory of stress distribution.   7M   3   1

b) The four legs of a transmission tower form in plan a square of side 4m and together carry a total load of 200kN. Compute the increase in vertical stress at a depth of 3m vertically below a Leg. Use Boussinesq's theory.   7M   3   3

UNIT–IV

7. a) Define Pre-consolidation pressure. Describe the procedure for determining the Pre-consolidation pressure from the results of one dimensional consolidation test.   7M   4   2

b) A clay bed has a thickness of 4m. The effective overburden pressure at the middle of the clay layer is 100 kN/m². Determine the change in the thickness of clay layer, if effective overburden pressure is increased by 40% of initial overburden pressure. Assume the following date : Natural water content = 36% ; Liquid Limit = 60% and G_s = 2.68   7M   4   3

OR

8. Stating the assumptions, derive Terzaghi's one dimensional consolidation equation.   14M   4   2

UNIT–V

9. a) Write brief notes on Mohr's circle, unconfined compression test   7M   5   1

b) Classify tests based on drainage conditions. Explain how pore pressure variation and volume change take place during these tests   7M   5   2

OR

10. a) Differentiate between direct shear test and triaxial shear test.   7M   5   2

b) In a drained tri axial compression test, a saturated specimen of cohesion less sand fails under a deviator stress of 535kPa when the cell pressure is 150kPa. Find the effective angle of shearing resistance of sand by analytical method.   7M   5   4

END

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022
Structural Analysis
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)
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		Marks	CO	BL

<div align="center">UNIT–I</div>

1. A fixed beam of span 6 m carries point loads 20 kN and 15 kN at distances 2 m and 4 m from the left end. Find the fixed end moments and the reactions at the supports. Draw BMD & SFD.   **14M   1   1**
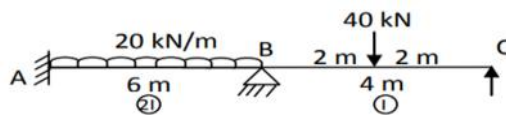
<div align="center">OR</div>

2. A fixed beam of length 6m carries point loads of 160KN and 120KN at a distance of 1.5m and 3.5m from left end A. find the fixed end moments and the reactions at the supports. Draw B.M and S.F diagrams.   **14M   1   2**

<div align="center">UNIT–II</div>

3. Analyze the continuous beam shown in figure by theorem of three moments. Draw SFD & BMD.

    14M   2   2

<div align="center">OR</div>

4. A continuous beam ABCD of length 15m rests on four supports covering 3 equal parts spans and carrying a uniformly distributed load of 1.5 KN/m length. Calculate the moments and reactions at the supports. Draw S.F and B.M diagrams also.   **14M   2   2**

<div align="center">UNIT–III</div>

5. A beam ABC 9m long consists of spans AB and BC of lengths 6m and 3m respectively. It is fixed at the end A and simply supported at B and C. the span AB carries a UDL of 10 kN/m while the span BC carries a UDL of 20kN/m. Determine the reactions and moments at the supports and draw B.M diagram.   **14M   3   2**

<div align="center">OR</div>

6. Determine the support moments for the continuous beam shown in figure and draw the B.M diagram. Analyse in Moment Distribution method
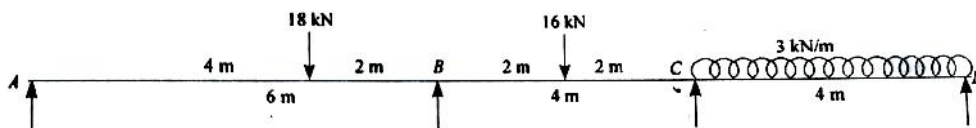
    14M   3

<div align="center">UNIT–IV</div>

7. Five wheel loads 15kN, 25kN, 18kN, 21kN and 29kN spaced at 2m interval roll on a girder of span 25m from left to right with the 15 kN load leading. Find the absolute maximum bending moment for the girder.   **14M   4   4**

<div align="center">OR</div>

8. Two wheel loads 200kN and 80kN spaced 0.8m apart roll on the girder.
   i) Find the maximum positive and negative shear force at the section C.
   ii) Find the maximum positive and negative bending moments that can occur.   **14M   4   4**

<div align="center">UNIT–V</div>

9. Write short notes on:
   (a) Indeterminate structures. (b) Uses and application of influence lines   **14M   5   4**

<div align="center">OR</div>

10. Find the deflection and slope at quarter span of simply supported beam of span L and loaded with uniformly distributed load of intensity w per unit length throughout the span.   **14M   5   3**

<div align="center">***</div>

Code: 19A153T

R-19

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022
Water Resource Engineering
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. Explain in detail about types of canal lining   14M

OR

2. Design an irrigation canal to carry a discharge of 5 Cumec. Assume N= 0.0225, m=1.0
    and B/D=3.24.   14M

UNIT–II

3. Derive principal stresses and shear stresses for elementary profile of gravity dam with
    a neat sketch.   14M

OR

4. Describe the causes of failures of earth dams with net sketches   14M

UNIT–III

5. Describe Bligh's creep theory.   14M

OR

6. What is the importance of exit gradient? How would you check the exit gradient?   14M

UNIT–IV

7. Using the following data design Sarda type fall. Neglect thickness of floor.
    Full supply discharge 45 cumec both u/s and d/s.
    Full supply level 118.3 m for u/s, 116.8 m for d/s.
    Full supply depth 1.8 m both u/s and d/s.
    Bed width 28 m both u/s and d/s.
    Bed level 116.50 m for u/s, 115.00 m for d/s.
    Drop 1.5 m.   14M

OR

8. Describe the design principles of straight glacis fall.   14M

UNIT–V

9. Explain about open flume outlet and orifice semi module outlet   14M

OR

10. Explain about canal fluming in design of cross drainage works by Hind's method   14M

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R-19

Code: 19A15FT

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022

Watershed Management

(Civil Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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			Marks	CO	BL

UNIT–I

| 1. | a) | What do you mean by watershed management? | 7M | CO1 | L2 |
| | b) | What are the important watershed factors to be considered in watershed management | 7M | CO1 | L2 |

OR

| 2. | a) | Justify why watershed development programme is necessary | 7M | CO1 | L3 |
| | b) | Explain how integrated and multi-disciplinary approach will help watershed management. | 7M | CO1 | L3 |

UNIT–II

| 3. | a) | Write a short note on Reclamation of saline and alkaline soils | 7M | CO2 | L3 |
| | b) | Explain social forestry and afforestation | 7M | CO2 | L2 |

OR

| 4. | a) | What is land use and land cover? | 7M | CO2 | L2 |
| | b) | Explain Universal soil loss equation (USLE) in detail | 7M | CO2 | L3 |

UNIT–III

| 5. | a) | Write a short note on land grading operation. | 7M | CO3 | L2 |
| | b) | What are the basic steps to begin the process of Rain Water Harvesting? | 7M | CO3 | L1 |

OR

| 6. | a) | What are the different means by which you harvest rainwater? Use neat sketches wherever necessary. | 7M | CO3 | L2 |
| | b) | Discuss in detail about water harvesting structures. | 7M | CO3 | L2 |

UNIT–IV

| 7. | | What do you understand by artificial recharge? Explain | 14M | CO4 | L2 |

OR

| 8. | a) | Distinguish between farm ponds and percolation tanks | 7M | CO4 | L2 |
| | b) | Discuss different types of check dams | 7M | CO4 | L2 |

UNIT–V

| 9. | | Give a detailed explanation on micro farming | 14M | CO5 | L2 |

OR

| 10. | | Write a brief note on the cropping pattern | 14M | CO5 | L3 |

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III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022
Basic Reinforced Concrete Design
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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PART-A
Answer *any one* question carry's 28 marks

		Marks	CO	BL
1.	Design the two way slab of span 5x6m subjected to an imposed load of 15KN/m². The Two adjacent edges are discontinuous. Use M_{25} concrete and fe_{415} steel. Draw the cross-section with reinforcement details.	28M	3	3

OR

| 2. | Design a square footing for a short axially loaded column of size 300mm x 300mm carrying 630kN load. Use M_{20} grade concrete and Fe_{415} steel. SBC of soil is 180kN/m². Sketch the details of reinforcements. | 28M | 5 | 3 |

PART-B
Answer *any three* questions
Each question carry's 14 marks

3.	a)	What is meant by limit state? Discuss different limit states to be considered in reinforced concrete design	10M	1	1
	b)	List out the assumptions made in limit state method.	4M	1	1

4.	Design the torsion reinforcement for a beam of size 300X600mm in size is subjected to shear force 70KN, torsionalmoment 50KNm and bending moment 24KNm.Consider 0.3% of tension steel is provided, M 20 grade concrete and mild steel bars. Assume any required data.	14M	2	3

5.	Design a rectangular column of 4.5 m unsupported length, restrained in position and direction at both the ends, to carry an axial load of 500 kN and moment 310KNm. Use M20 grade concrete and Fe415 steel.	14M	4	2

6.	Check for the limit state of deflection using empirical method for the T beam with following data. Ast = 1600 mm² ; Asc=900 mm² , bw=300mm, d=400mm, bf= 900mm; Fe415; Span= 8m and continuous	14M	5	2

7.	a)	Differentiate the working stress method and limit state method.	10M	1	1
	b)	Define neutral axis and lever arm.	4M	1	1

END

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES, RAJAMPET (AUTONOMOUS)

II B.Tech II Semester **CE Mandatory Course Supplementary** Examination
19AC45T-Essential of Indian Traditional Knowledge

H.T. No:-

Date:-26-12-2022   Duration: 3Hrs.
Answer any five questions from the following.   5X20=100 Marks

		Marks	Course Outcomes	Bloom's Level
1	Explain the importance of Indian Culture and Heritage and how they contribute to fundamental unity of India.	20M	1	2
2	Bring out some of the major inventions of Indian sages and its relevance in the present society?	20M	3	2
3	Bring out the significance of Vedas, and briefly explain types of four Up-vedas?	20M	2	2
4	Discuss the characteristic features of Indian way of life and its importance in Modern world.	20M	1	2
5	Explain the importance of Ayurveda and Yoga to keep oneself healthy in the Mechanical world.	20M	3	1
6	Discuss in detail the following significant Indian art forms a) Classical Dances of India b) Paintings	20M	3	2
7	Write the relevance of Science and Spirituality in the current Technical world?	20M	3	1
8	Briefly explain the relevance of Science and Spirituality in the present Technical world?	20M	3	1

III B.Tech. I Semester Supplementary Examinations Nov/Dec 2022
Prestressed Concrete
(Civil Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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			Marks	CO	BL

UNIT–I

1. Elucidate the need for high strength steel and high strength concrete in prestressed concrete. — 14M 1 2

OR

2. Discuss in detail about different post-tensioning anchorages with neat sketches. — 14M 1 2

UNIT–II

3. a) Discuss the Loss of pre-stress in pre-tensioned and post-tensioned members due to elastic shortage of concrete. — 7M 2 2

   b) Explain the Relaxation of steel and its influence in the strength of the prestressed concrete member. — 7M 2 2

OR

4. a) Define creep. Mention the factors influencing the creep of psc members. — 7M 2 2

   b) A prestressed concrete beam of rectangular section 120mm wised and 350mm deep is prestressed by 6 wires of 6 mm diameter, provided at an eccentricity of 55mm. the initial stress in the iwres is 1100 N/mm^2. Find the loss of stress in steel due to creep of concrete. take moudulus of elasticity as 2×10^6 N/mm^2 and $E_c = 3 \times 10^4$ N/mm^2, = 1.50 — 7M 2 4

UNIT–III

5. A prestressed concrete beam of section 120 mm wide by 300 mm deep is used over an effective span of 6 m to support a uniformly distributed load of 4 kN/m, which includes the self- weight of the beam. The beam is prestressed by a parabolic cable carrying a force of 180 kN and located at an eccentricity of 50 mm. compute the extreme stress at central span sections and end section. — 14M 3 3

OR

6. Sketch the resultant stress at the top and bottom of the mid span section of a pre-tensioned member with the following data.
   Cross-sectional dimensions of the member = 300 mm x 650 mm, $A_p = 220$ mm^2,
   $f_{ck} = 40$ N/mm^2 , $f_p = 1550$ N/mm^2, L = 6.2 m, udl = 12 kN/m. — 14M 3 3

UNIT–IV

7. a) Define i) Kern   ii)Pressure line and thrust line — 4M 4 1

   b) Mention the cable profiles Discuss the effect of Tendon profile on deflection of PSC beam — 10M 4 2

OR

8. Explain the design procedure of I-section according to IS code. — 14M 4 2

UNIT–V

9. Explain in detail about the analysis of end block by Magnel method. — 14M 5 2

OR

10. Write short notes on:
    i) Short term deflection.   ii) Long term deflection.
    iii) Factors affecting the long term and short term deflection of PSC members. — 14M 5 2

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