

Hall Ticket Number :

R-19

Code: 19A15BT

III B.Tech. I Semester Supplementary Examinations July 2022

Prestressed Concrete

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

Marks

UNIT-I

1. a) Explain with neat sketches the IS1343 code method of computing the moment of resistance of a rectangular section. 10M
- b) Mention the advantages of prestressed concrete over reinforced concrete. 4M

OR

2. Write a short note on
- (i) Kern Distance, 4M
- (ii) bonded and unbonded prestressing concrete, 6M
- (iii) concordant prestressing. 4M

UNIT-II

3. A pre-tensioned beam 200 mm wide and 400 mm deep is pre-stressed by 7 wires of 7 mm diameter initially stressed to 1200N/mm^2 with their centroid located 100 mm from the soffit. Estimate the percentage loss of stress in the wires with the following data. 14M
- Relaxation of stress in steel = 5 percent, $E_s = 210\text{ kN/mm}^2$, $f_{ck} = 45\text{ N/mm}^2$, Creep coefficient = 1.6,
Total shrinkage strain = 3×10^{-4} .

OR

4. a) Discuss the Loss of pre-stress in pre-tensioned and post-tensioned members due to elastic shortage of concrete. 8M
- b) Explain the Relaxation of steel and its influence in the strength of the member. 6M

UNIT-III

5. A bonded post-tensioned pre-stressed concrete rectangular beam of cross section 300 mm x 650 mm has high tensile steel tendons of cross-sectional area 4500 mm^2 located at an effective depth of 600 mm. If the characteristic strength of concrete and steel is 40 and 1600 N/mm^2 , respectively, calculate the flexural strength of the section. 14M

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-section of the member = 300 mm x 600 mm,
 $A_p = 220 \text{ mm}^2$, $f_{ck} = 45 \text{ N/mm}^2$, $f_p = 1550 \text{ N/mm}^2$,
 $L = 6.2 \text{ m}$, $udl = 12 \text{ kN/m}$.

14M

UNIT-IV

7. A rectangular continuous pre-stressed concrete beam has two spans of length 8 m each has width 125 mm and depth 350mm. The tendon carries an effective pre-stressing force of 420kN and is located at 100 mm from the soffit. The beam carries an imposed load of 3.5 kN/m. Locate the resultant line of thrust.

14M

OR

8. Design the transverse reinforcement for a pre-tensioned pre-stressed concrete beam of rectangular cross-section 300 mm wide and 600 mm deep with an ultimate bending moment of 200 kN-m, ultimate torsional moment of 70 kN-m and ultimate shear force of 100 kN. The section has an effective pre-stressing force of 520 kN at an eccentricity of 200 mm. The area of pre-stressing steel is 450 mm^2 having an ultimate tensile strength of 1700 N/mm^2 . Cube strength of concrete is 40 N/mm^2 . $V_{c1} = 30 \text{ kN}$; $T_{c1} = 32 \text{ kN-m}$.

14M

UNIT-V

9. The end block of a post-tensioned PSC beam 300 mm wide and 400 mm deep is subjected to a concentric anchorage force of 800 kN by a Freyssinet anchorage system of size 110 mm x 110 mm. Design and detail the anchorage reinforcement for the end block.

14M

OR

10. A pre-stressed concrete rectangular beam 300 mm wide and 650 mm deep is subjected to an effective pre-stress of 2050kN. The beam has a parabolic tendon with an eccentricity of 160mm in the mid-span. The span of the beam is 6.2 m and is subjected to a uniformly distributed load of 55 kN/m. The characteristic strength of concrete is 45 N / mm^2 . Evaluate the short time deflection at centre.

14M

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R-19

Code: 19A152T

III B.Tech. I Semester Supplementary Examinations July 2022

Soil Mechanics

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

Marks CO Blooms Level

UNIT-I

- 1. a) With the help of phase diagram, define *water content, voids ratio, specific gravity and degree of saturation*. Hence derive the relation: $eS_r = wG$ 7M
- b) A fully saturated soil sample has a water content of 35% and specific gravity of 2.65. Determine its porosity, saturated unit weight and dry unit weight. If the water content is 15%, what will be the amount of water to be added for saturation? 7M

OR

- 2. a) With the help of particle distribution curves, explain *WELL GRADED, UNIFORMLY GRADED and GAP GRADED SOILS* 3M
- b) Explain Indian Standard Classification System 4M
- c) A liquid limit test on Clayey sample gave the following results. The plastic limit of soil is found to be 20%. Determine (i) Liquid Limit, (ii) Flow Index and (iii) Consistency Index

No. of Blows(N)	12	18	22	34
Water Content (%)	56	52	50	45

7M

UNIT-II

- 3. a) State Darcy's Law for Permeability through soils. Discuss the properties affecting Permeability of Soils 7M
- b) In a falling head permeability test, the initial head of 300m drops by 1cm in 3 minutes. How much long the test is to be continued if the head is to be dropped to 180m? 7M

OR

- 4. a) What re flow nets? List the characteristics and uses of flow nets. 7M
- b) Explain with a neat sketch the method of locating phreatic lines in a homogeneous earth dam having horizontal filter 7M

UNIT-III

- 5. a) Compare Boussinesq's and Westergaard's Analysis. Also state their limitations 7M
- b) Find the intensity of vertical pressure and horizontal shear stress at a point 4m directly under 20kN load acting on the ground surface. What will be the vertical pressure and horizontal shear stress at a point located at the same depth of 4m but at a distance 2m away from the axis of point load? 7M

OR

6. a) What do you understand by field compaction control? Hence explain Proctor's needle method of determining Placement Water Content 7M
- b) Following observations were made in a compaction test. Plot the compaction curve and determine the optimum moisture content and its corresponding MDD. Draw also zero air voids line.

Water Content (%)	7.7	11.5	14.6	17.5	19.5	21.2	
Weight of wet soil(N)	16.67	18.54	19.52	19.92	19.23	18.83	7M

UNIT-IV

7. a) Explain Spring analogy theory to explain the principle of consolidation of saturated clay soils 7M
- b) In a consolidation test, voids ratio of a clayey sample decreased from 1.20 to 1.10 when pressure was increased from 160 to 320 kN/m². Determine the coefficient of consolidation of the soil if the coefficient of permeability is 8×10^{-7} mm/sec. 7M

OR

8. a) Differentiate: *under consolidated, normally consolidated and over consolidated* soils 3M
- b) How is preconsolidation pressure is determined by Casagrade's Method? 6M
- c) A clay sample of 2cm thick takes 20 minutes to reach 20% consolidation in a laboratory oedometer test. Find the time taken by the same clayey soil of 6m thick in the field to reach 40% consolidation. Assume double drainage in both the cases. 5M

UNIT-V

9. a) Explain Mohr-Coulomb shear strength theory, enlisting the assumptions made in the theory 7M
- b) A consolidated undrained test on a soil sample gave the following results. Determine the shear strength parameters in terms of (i) total stresses and (ii) effective Stresses

Cell pressure(kN/m ²)	200	400	600	
Deviator stress at failure(kN/m ²)	118	240	352	
Pore water pressure(kN/m ²)	110	220	320	7M

OR

10. a) Explain the different drainage conditions under which triaxial test can be performed 4M
- b) List the advantages and disadvantages of direct shear test 4M
- c) Explain vane shear test with a neat sketch. Derive the relation between torque applied and shear parameters 6M

END

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Code: 19A154T

III B.Tech. I Semester Supplementary Examinations July 2022

Structural Analysis

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

		Marks	CO	Blooms Level
UNIT-I				
1.	A fixed beam of 6m span supports two point loads of 350 kN each at 2m from each end. Find the fixing moments at the ends and draw the B.M and S.F diagrams. Find also the central deflection. Take $I=9 \times 10^8 \text{ mm}^4$ and $E=200 \text{ kN/mm}^2$.	14M	CO1	L1
OR				
2.	A fixed beam AB of span 6m carries a uniformly distributed load of 20 kN per metre run over the left half and 30 kN per metre run over the right half and a concentrated load of 40 kN at the centre of the span. Calculate the fixed end moments. Assume uniform flexural rigidity.	14M	CO1	L1
UNIT-II				
3.	A continuous simply supported beam ABCD consists of three spans of 7m, 8m and 9m respectively on the spans. Determine the bending moments and reactions at the supports.	14M	CO2	L3
OR				
4.	A continuous beam ABC consists of spans AB and CD of lengths 4m and 6m respectively, the ends A and B are fixed. The span AB carries a uniformly distributed load of 24 kN/m while the span BC carries a point load of 108 kN at a distance of 2m from the end C. Find the support moments and support reactions.	14M	CO2	L2
UNIT-III				
5.	A beam ABC, 12m long, fixed at A and C and continuous over support B, carries a uniformly distributed load of 2kN/m over the span AB and a point load of 12kN at the mid span of BC. Calculate the end moments and plot the bending moment diagram using slope deflection method. EI is constant throughout. (AB=BC=6m).	14M	CO3	L3
OR				
6.	A continuous beam ABCD consists of three spans with fixed supports on both ends and simple supports at B and C. Span AB=6m, BC=5m, and CD=5m. An uniformly distributed load of 2 kN/m acts on AB. A point load of 5kN acts at 3m from B. A point load of 8kN acts at the mid span of CD. Flexural rigidities are I, 2I and I for AB, BC and CD respectively. Determine the bending moments at the supports, using Moment distribution method.	14M	CO3	L3
UNIT-IV				
7.	An uniformly distributed live load of 10 kN/m, covering a length of 20 m, crosses a girder of span 45 m. Determine the values of maximum shear force and bending moment at a section 15 m from the left hand support.	14M	CO4	L4
OR				
8.	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	CO4	L4
UNIT-V				
9.	A lamp post ABC consists of a vertical part AB of length L and a horizontal part BC of length L/8 the lower end A of the post being fixed. It carries a point load P at C. Find the vertical and horizontal components of the deflection of C. Assume uniform flexural rigidity EI.	14M	CO4	L4
OR				
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	CO5	L4

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Code: 19A153T

III B.Tech. I Semester Supplementary Examinations July 2022

Water Resource Engineering

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

Marks CO Blooms Level

UNIT-I

1. a) Compare Kennedy's and Lacey's silt theories. 6M CO1 L2
- b) Using Lacey's theory, design an irrigation channel for the following data:
- Discharge $Q = 30 \text{ m}^3/\text{s}$
- Silt factor $f = 1.00$
- Side slopes = 1/2 : 1 8M CO1 L3

OR

2. a) What is 'Irrigation'? Explain the advantages and ill-effects of irrigation. 7M CO1 L2
- b) A field channel has culturable commanded area of 2000 hectares. The intensity of irrigation for gram is 30% and for wheat is 50%. Gram has a kor period of 18 days and kor depth of 12cm, while wheat has a kor period of 15 days and a kor depth of 15 cm. Calculate the discharge of the field channel. 7M CO1 L3

UNIT-II

3. a) Discuss the physical factors that govern the selection of type of dam. 6M CO2 L2
- b) Explain the method of calculating reservoir capacity for a specified yield, from the mass inflow curve. 8M CO2 L2

OR

4. a) Design the practical profile of a gravity dam of stone masonry, given the following data:
- R.L. of base of dam = 1450m.
- R.L. of F.R.L. = 1480.5m.
- Specific gravity of the masonry = 2.4
- Safe compressive stress for masonry = 1200kN/m²
- Height of waves = 1m. 7M CO2 L3
- b) Explain the various seepage control measures in earth dams. 7M CO2 L2

UNIT-III

5. a) What is an Ogee spillway? Explain the design principles of Ogee spillways. 7M CO3 L2
- b) Explain any two types of spillway crest gates with the help of sketches. 7M CO3 L2

OR

6. a) Draw the layout of a diversion headwork and explain its component parts. 8M CO3 L2
- b) Explain the Khosla's method of independent variables. 6M CO3 L2

UNIT-IV

7. a) What do you understand by a fall in a canal? Why is it necessary? How do you select its location? 6M CO4 L2
- b) Explain the procedure of designing Sarda type fall. 8M CO4 L2

OR

8. a) What is a cross regulator? Explain the functions of a cross regulator. 6M CO4 L2
- b) Explain the design procedure of a distributary head regulator. 8M CO4 L2

UNIT-V

9. a) What is a 'canal outlet'? Explain the different types of outlets. 7M CO5 L2
- b) Define sensitivity of an outlet. Find the relation between sensitivity and flexibility of an outlet. 7M CO5 L2

OR

10. a) What is a cross- drainage work? Explain the different types of cross- drainage works. 8M CO5 L2
- b) Explain the design principles of an aqueduct. 6M CO5 L2

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R-19

Code: 19A151T

III B.Tech. I Semester Supplementary Examinations July 2022

Basic Reinforced Concrete Design

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

PART-A**Answer any one questions carry's 28 marks**

1. A rectangular reinforced concrete beam is simply supported on two masonry walls 230 mm thick and 6 m apart (centre to centre). The beam is carrying an imposed load of 15 kN/m. Design the beam using limit state method with all necessary checks. Use M25 concrete and Fe 415 steel. Sketch the details of reinforcement.

Marks	CO	Blooms Level
28M	CO1	L4

OR

2. A reinforced concrete column 400 mm by 400 mm supports an axial service load of 1200 kN. The safe bearing capacity of the soil at site is 200 kN/m². Adopting M25 grade concrete and Fe415 HYSD bars design a suitable footing for the column and sketch the details of reinforcement.

28M	CO1	L4
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PART-B**Answer any three questions****Each question carry's 14 marks**

3. a) What is meant by characteristic strength of a material as used in IS 456 -2000?
b) Explain the term μ (lim) and give the expression for this value for Fe 415 steel.
4. A simply supported rectangular beam 300 mm x 500 mm effective depth carries UDL load 50 kN/m include self-weight over a effective span of 6 m. Design the shear reinforcement of beam and detail under the following conditions: ii) Use Two legged vertical stirrups ii) Use combination of Two bent up bars (16mm diameter) and stirrups Assume the beam reinforced with 4nos -12mm diameter at top and 6nos-16mm diameter bar at bottom and width of supports on which beam rests is 300mm. (use concrete M25 grade and Steel reinforcement Fe415).
5. A rectangular R.C beam of size 300x450mm is reinforced with tensile steel 3no 16mm diameter bars and compressive steel 3nos 12mm diameter bars. Find out the allowable bending stress in concrete and steel if the beam subjected to maximum bending moment of 60kN-m. Use effective cover to reinforcement 50mm. Suggest the grade of concrete and steel used for beam design.
6. Design the reinforcement of R.C square column 300x300mm size fixed at both ends over a clear height of 6m. The column carrying axial load 30kN and moment 2kN-m .Apply relevant design checks and neatly detail the reinforcement. Use concrete grade M25 and HYSD steel Fe500.
7. Explain in detail the Indian standard code recommendations for design of footings as per IS: 456: 2000.

7M	CO2	L2
7M	CO2	L2
14M	CO2	L3
14M	CO3	L4
14M	CO3	L4
14M	CO4	L4

END

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R-19 (SS)

Code: 19A142T

III B.Tech. I Semester Supplementary Examinations July 2022

Concrete Technology
(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

		Marks	CO	Blooms Level
UNIT-I				
1.	Describe various chemical components of cement and importance after hydration.	14M	CO1	L1
OR				
2.	List and explain different admixtures for concrete.	14M	CO1	L1
UNIT-II				
3.	Describe how compaction factor test is conducted on fresh concrete in the laboratory.	14M	CO2	L2
OR				
4.	Describe the pullout test procedure on concrete.	14M	CO2	L2
UNIT-III				
5.	Explain the method of evaluating the modulus of elasticity of hardened concrete in the laboratory?	14M	CO3	L2
OR				
6.	Discuss factors affecting shrinkage of concrete?	14M	CO3	L1
UNIT-IV				
7.	What do you understand by target mean strength and find target mean strength of M25 grade after 28 days.	14M	CO4	L2
OR				
8.	Differentiate between IS and ACI method of mix designs	14M	CO4	L2
UNIT-V				
9.	Discuss the applications of the special concretes	14M	CO5	L2
OR				
10.	Explain mix design of SCC using EFNARC guide lines	14M	CO5	L2

END

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R-19

Code: 19A15GT

III B.Tech. I Semester Supplementary Examinations July 2022

Disaster Management

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5 x 14 = 70Marks)

	Marks	CO	Blooms Level
UNIT-I			
1. a) Distinguish between hazard and disaster.	7	CO1	2
b) Define natural disaster and give a suitable example and its consequences.	7	CO1	2
OR			
2. a) Explain about the preventive measures for overcoming the hazards.	8M	CO2	2
b) Define the terms risk, vulnerability and capacity.	6M	CO2	1
UNIT-II			
3. Classify the types of disasters. Explain in brief about the various natural disasters with suitable examples.	14M	CO2	1
OR			
4. a) Discuss about the consequences of industrial pollution on the environment and human life.	8M	CO2	2
b) Write a short note on vulnerability profile of India.	6M	CO2	2
UNIT-III			
5. Explain the impact of disaster on the ecological and social life.	14M	CO3	3
OR			
6. a) What are the demographic factors impacting a disaster?	8M	CO3	2
b) What is meant by urban disaster? How it affects the social life of the people?	6M	CO3	3
UNIT-IV			
7. Briefly explain about the various phases of disaster management cycle.	14M	CO4	1
OR			
8. Discuss about the roles of the following in the disaster risk reduction (a) Government (b) Community (c) NGOs (d) Local institutions	14M	CO4	1
UNIT-V			
9. a) How sustainable and environmental friendly recovery can be achieved? Explain.	8M	CO4	3
b) What are the impacts of urbanization on vulnerability	6M	CO5	2
OR			
10. Explain about the various reconstruction and development methods for disaster recovery.	14M	CO5	1

END

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R-19

Code: 19AE41T

II B.Tech. II Semester Supplementary Examinations July/August 2022

Managerial Economics and Financial Accounting

(Common to CE & ME)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. Define managerial economics. Illustrate how it helps in solving managerial problems and explain the nature.

Marks CO Blooms Level

14M CO1 L4

OR

2. What is Elasticity of Demand, Elucidate the types of Elasticity of Demand with graphical representation?

14M CO1 L3

UNIT-II

3. Outline Production function. Describe the factors affecting production function with suitable examples.

14M CO2 L2

OR

4. Determine the Break-even point. What are the assumptions and importance of Break-even analysis?

14M CO2 L3

UNIT-III

5. Explain the following

A) Features of Isoquants

B) Difference between Perfect competition and Monopoly.

7M CO3 L5
7M

OR

6. Differentiate features of Private Limited Company to that of Public Limited Company?

14M CO3 L2

UNIT-IV

7. Define capital Budgeting? Elucidate the various techniques of capital budgeting.

14M CO4 L3

OR

8. Kumar & Co Ltd is contemplating the purchase of machinery. Two machines A and B are available each at Rs. 2,50,000.

Net cash inflows (Amt, in Rs.)

Year	Machine A	Machine B
1	75,000	25,000
2	1,00,000	50,000
3	1,25,000	1,00,000
4	75,000	1,50,000
5	50,000	1,00,000

14M CO4 L3

Calculate NPV @10%

UNIT-V

9. Deliberate the different types of financial ratios in ratio analysis?

14M CO5 L2

OR

10. Classify the financial ratios. With assumed data, illustrate any two types of ratios under each category?

14M CO5 L4
