UNIT-IV

S.No	Questions	BTL	CO	PO
Part–A (Short Answer Questions)				
1	What is meant by end block in a post tensioned member?	L1	CO4	PO1
2	State Guyon's theorem?	L1	CO4	PO1
3	Sketch the end block when stress distribution in a post tensioned system.	L3	CO4	PO1
4	Sketch the typical reinforcement provided in Anchorage zone?	L3	CO4	PO1
5	What are the factors that influence the transmission length?	L1	CO4	PO1
6	What is called tension stiffening effect?	L1	CO4	PO1
7	What are the three mechanisms in the bond?	L1	CO4	PO1
8	What is known as splitting tensile stress and splitting bursting force	L1	CO4	PO1
9	Why reinforcement is necessary in anchorage zone or end block?	L2	CO4	PO2
10	What is meant by transmission length? Sketch Hoyer effect.	L1	CO4	PO1
11	Give an expression for bursting tensile force in anchorage zone of prestressed concrete members.	L1	CO4	PO1
12	Discuss about the anchorage zone reinforcement.	L2	CO4	PO1
13	Define the terms (a) end block (b) Anchorage zone (c) Bursting tension	L1	CO4	PO1
Part–B (Long Answer Questions)				
1	The end block of a PSC beam with rectangular cross section is 100mm wide and 200mm deep. The prestressing force of 100kN is transmitted to the concrete by a distribution plate of 100mm x 50mm, concentrically loaded at the ends. Calculate the position and the magnitude of tensile stress on the horizontal section through the centre and edge of the anchor plate. Compute the bursting tension on the horizontal planes.	L3	CO4	PO3
2	A PSC beam 250mm wide and 650mm deep is subjected to an effective prestressing force of 1360kN along the centroidal axis. The cable is placed symmetrically over the mild steel anchor plate of area 150mm x 350mm. Design the end block. Take fck = 30N/mm2. Assume initial prestressing force is 1.2 times the effective prestressing force.	L6	CO4	PO4
3	Explain briefly about the Magnel's method and Guyon's method for end block.	L2	CO4	PO1
4	A post tensioned concrete rectangular beam, 240mm wide by 500mm depth, is grouted before the application of live loads. The steel consists of three tendons, each made of 12 numbers of 7mm diameter wire encased in a thin metallic hose of 30mm diameter with an effective cover of 50mm. the modulus of elasticity of steel and concrete are 210 and 35kN.mm^2 respectively. The beam spans 10m and supports two concentrated loads of 250kN each at the third points. Compute the unit bond stress.	L3	CO4	PO3
5	A PSC beam 250mm wide and 650mm deep is subjected to an effective prestressing force of 1360kN along the centroidal axis. The cable is placed symmetrically over the mild steel anchor plate of area 150mmx 350mm. Design the end block. Take fck=30N/mm^2. Assume initial prestressing force is 1.2 times the	L6	CO4	PO4

	effective prestressing force.			
6	Explain with sketches the effect of varying ratio of depth anchorage to the depth of end block on the distribution of bursting tension.	L2	CO4	PO2
7	The end block of a post tensioned bridge girder is 500mm wide by 1000mm deep. Two cables, each comprising 90 high tensile wires of 7mm diameter are anchored using square plates of side length 400mm with their centres located at 500mm from the top and bottom of the edges of the beam. The jacking force in each cable is 4000kN. Design a suitable anchorage reinforcement using Fe415 grade HYSD bars conforming to IS: 1343 provision.	L6	CO4	PO4
8	The end block of a PSC beam with rectangular cross section is 100mm wide and 200mm deep. The prestressing force of 100kN is transmitted to the concrete by a distribution plate of 100mmx50mm, concentrically loaded at the ends. Calculate the position and the magnitude of tensile stress on the horizontal section through the centre and edge of anchor plate. Compute the bursting tension on the horizontal planes.	L3	CO4	PO3
9	Estimate the transmission length at the ends of a pre-tensioned beam prestressed by 8mm diameter wires. Assume the cube strength of concrete at transfer as 42N/mm2. A pre-tensioned beam is prestressed using 5mm diameter wires with an initial stress of 80% of the ultimate tensile strength of steel=1600N/mm^2. The cube strength of concrete at transfer is 30N/mm^2. a) Calculate the transmission length b) Compute the bond stress at ¼ and ½ transmission length from the end, c) Calculate the overall average bond stress	L4	CO4	PO3
10	A pre-tensioned rectangular beam width of 200mm and 500mm overall depth, is prestressed by 5 wires of 7mm diameter located 100mm from the soffit. The maximum shear force at a particular section is 100kN. If the modular ratio is 6, calculate the bond stress developed assuming a) the section as uncracked, b) the section as cracked	L4	CO4	PO3

Blooms Taxonomy Level (BT) (L1–Remembering; L2–Understanding; L3–Applying; L4– Analyzing; L5–Evaluating; L6–Creating)