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CBCS SCHEME

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BCV703

Seventh Semester B.E./B.Tech. Degree Examination, June/July 2026
Pre-stressed Concrete

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.
3. Use of IS-1343 code is permitted.

		Module – 1	M	L	C
Q.1	a.	Distinguish between RCC and PSC.	10	L2	CO1
	b.	Explain with a neat sketch of Pre Tensioning and Post Tensioning methods.	10	L2	CO1
		OR			
Q.2	a.	List out different advantages and limitations of PSC.	10	L2	CO1
	b.	Explain why High Strength Concrete and High strength steels are used in PSC.	10	L2	CO1
		Module – 2			
Q.3	a.	List the different types of losses in pre-tensioning and post tensioning.	6	L1	CO2
	b.	A PSC beam of size 200 mm ×300 mm of span 6 m. The beam is subjected to initial prestressing force of 400 kN at an eccentricity 70 mm. Area of tendons 400 mm^2. Assuming Elastic modulus of steel and concrete are 2×10^5 N/mm^2 and 3×10^4 N/mm^2 respectively. Anchorage slip is 1.5 mm. Creep co-eff 2. Creep shrinkage is 0.0002. Creep in steel is 3%. Assume in 8 days. Estimate the loss in prestress due to, (i) Elastic deformation of concrete. (ii) Loss due to shrinkage of concrete. (iii) Loss due to creep of concrete. (iv) Relaxation of steel. (v) Anchorage slip.	14	L3	CO2
		OR			
Q.4	a.	Explain the following with a neat sketches : (i) Freyssinet system (ii) Gifford Udal system	10	L1	CO2
	b.	Explain concepts of pressure line and load balancing in prestressed concrete design.	10	L1	CO3
		Module – 3			
Q.5	a.	List out different factors influencing deflection of PSC members.	4	L1	CO3

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	b.	A PSC beam of size 300 mm ×700 mm is prestressed with a force of 700 kN at an eccentricity of 150 mm. Span of beam is 9 m. Super imposed load is 12 kN/m. Assume loss of prestress is 20%. Unit weight of concrete is 24 kN/m^3. Determine the resultant stresses at midspan for the following cases of loading : (i) Initial stage without loss of prestress. (Prestress + Self weight + Live load) (ii) Final stage with loss of prestress 20% (Prestress + Self weight + Live load)	16	L3	CO3
		OR			
Q.6	a.	List out structural failures in PSC beam members.	4	L1	CO3
	b.	A PSC beam of size 200 mm×500 mm is prestressed by tendons having cross section area of 600 mm^2 located at 100 mm from soffit of the beam. Characteristic strength of concrete = fck is 40 N/mm^2 Characteristic strength of cable = fp is 1600 N/mm^2 Estimate ultimate strength of flexure of PSC beam for the following cases as per IS code provisions : (i) Beam is pretensioned (ii) Beam is post tensioned with effective bound	16	L3	CO3
		Module – 4			
Q.7	a.	Distinguish with sketches the difference between cylinder and non-cylinder types of PSC pipes.	10	L2	CO4
	b.	Explain with sketches the different shapes of PSC water tanks mentioning their advantages.	10	L2	CO4
		OR			
Q.8	a.	Mention and explain different advantages of PSC beams and slabs.	10	L2	CO4
	b.	Explain with a neat sketches of typical cross sections of prestressed concrete floor panels.	10	L2	CO4
		Module – 5			
Q.9	a.	List out different advantages using precast prestressed units in association with the in situ concrete.	10	L2	CO5
	b.	Explain with a neat sketches types of composite construction in PSC	10	L2	CO5
		OR			
Q.10	a.	Write a short notes on Railway sleepers.	10	L2	CO5
	b.	Explain the principle of balanced cantilever construction.	10	L2	CO5

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