FirstRanker.com
Firstranker's choice
www.FirstRanker.com www.FirstRanker.com

www.FirstRanker.com

FirstRanker.com
Firstranker's choice
www.FirstRanker.com www.FirstRanker.com

b) A concrete beam of span 8 m with the cross-sectional area of 42×10^3 mm^2 and the moment of inertia 4.75×10^8 mm^2 is prestressed by a parabolic cable carrying a prestressing force of 245 kN. The cable has an eccentricity of 50 mm at the centre and zero at the supports. Neglecting all losses, find the central deflection of the beam (i) self-weight + prestressed and (ii) self-weight + prestressed + live load of 1.8 kN/m. Consider concrete weight 24 kN/m^3 and $E_c = 40$ kN/mm^2.

12. a) A pretensioned, T-section has a flange 1200 mm × 150 mm. The width and depth of the rib are 300 and 1500 mm respectively. The high-tensile steel as an area of 4700 mm^2 and is located at an effective depth of 1600 mm. If the characteristic cube strength of the concrete and the tensile strength of the steel are 40 N/mm^2 and 1600 N/mm^2 respectively, calculate the flexural strength of the T-section.

(OR)

b) The support section of prestressed concrete beam, 100 mm × 250 mm, is required to support an ultimate shear force of 60 kN. The compressive prestress at the centroidal axis is 5 N/mm^2. The characteristic cube strength of concrete is 40 N/mm^2. The cover to the tension reinforcement is 50 mm. If the characteristic strength of steel in stirrups is 250 N/mm^2, design suitable reinforcements at the section using the IS : 1343 recommendations.

13. a) A continuous prestressed concrete beam ABC (AB = BC = 10 m) has a uniform rectangular section of 100 mm × 300 mm. The cable carrying an effective prestressing force of 360 kN is parallel to the axis of the beam and located at 100 mm from the soffit. (i) Determine the secondary and resultant moment at central support B. (ii) Locate the resultant line of thrust.

(OR)

b) Briefly explain the various steps involved in the design of continuous prestressed concrete beams.

14. a) A non cylindrical PSC pipe of 1000 mm diameter and thickness of concrete shell is 75 mm is required to convey water at a working pressure of 1.5 N/mm^2. The length of the pipe is 6 m. The loss ratio is 0.8. Determine the circumferential wire winding of using 5 mm diameter wires stretched to 1000 N/mm^2. The maximum permissible tensile stress is 11.2 N/mm^2.

(OR)

b) Discuss the design considerations adopted for prestressed concrete poles.

www.FirstRanker.com