SRINIX COLLEGE OF ENGINEERING

2nd INTERNAL EXAMINATION-2017-18

Subject-PC   Semester-8TH   Branch-**CIVIL**

Full Mark-**30**   Time-**1.30Hrs**

ANSWER ALL QUESTIONS (PART-A)   [2X5]

1. What is the difference between pretensioning and post tensioning?

2. Define 3-moment theorem?

3. What are the methods for improving the shear resistance of structural concrete members?

4. Explain advantages and disadvantages of continuous beam?

5. What are the factors affecting deflections in a PSC beam?

ANSWER ANY TWO QUESTIONS (PART-B)   [10X2]

1.A prestressed concrete beam 300mm wide and 800mm deep supports two concentrated loads of 20KN each at the 3rd point of a span of 9m.

(a) Suggest a suitable cable profile. If the eccentricity of the cable profile is 100mm for the middle third portion of the beam, calculate the prestressing force required to balance the bending effect of the concentrated loads (neglecting the self-weight)

(b) For the same cable profile, find the effective force in the cable if the resultant stress due to self-weight, imposed loads and prestressing force is zero at the bottom fibre of the mid-span section.

2. The deck of a PSC culvert is made up of 500mm thick. The slab is spanning over 10.4 m and supports a total udl of 23.5 kN/mm² (DL+LL). The modulus of elasticity of concrete is 38kN/mm². The concrete slab is prestressed by straight cables each containing 12 high-tensile wires of 7mm diameter stressed to 1200N/mm² at a constant eccentricity of 195mm. The cables are spaced at 328mm intervals in the transverse direction. Estimate the instantaneous deflection of the slab at center of span under prestress and imposed loads?

3. A rectangular prestressed beam is 150mm wide and 300mm deep is used over an effective span of 10m.The cable with zero eccentricity at the supports and linearly varying to 50mm at the center carries an effective prestressing force of 500KN.Find the magnitude of the concentrated load of Q located at the center of the span for the following conditions at the center of span section?

(a) If the load counteracts the Bending effect of the prestressing force

(b) Under the action of the external load, self weight and prestress