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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

END TERM TEST

SUMMER SEMESTER - JUNE 2016

B.Tech 8th Semester

COURSE CODE: 12M1WCE231 MAX. MARKS: 50

COURSE NAME: Prestressed Concrete Design

COURSE CREDITS: 03 MAX. TIME: 2 Hrs

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*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

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**Q1.** A post tensioned prestress concrete beam 300mm wide is to be designed for a live load of 25kN/m over a span of 15m.Premissible stresses are 15 $N/mm^2$ in compression and zero in tension. Using straight cable design the beam if losses are 15% (7)

**Q2.** A post tensioned prestress concrete beam of 30m span is subjected to a transfer of prestress force of 2500kN at 28 day's strength. The profile is parabolic with maximum eccentricity of 200mm at mid span. Determine the loss of prestress due to friction and jacking force required if jacking is done from both ends of the beam. c/s of beam is 500mm×800mm and is prestress with 9 cables ,each cable consisting of 12 wires of 5 mm dia. Ec= $3.5\times10^4$ $N/mm^2$ (7)

**Q3.** A prestressed concrete beam 200mm×300mm is prestressed with wires area320$mm^2$located at a constant eccentricity of 50mm carrying an initial stress of 1000$N/mm^2$. Span=10m.calculate the % loss of stress in wires if (7)

a) The beam is pre tensioned

b) The beam is post tensioned

Given $E_s$=210$kN/mm^2$ $E_c$=35$kN/mm^2$, steel relaxation=5%, shrinkage of concrete=$300\times10^{-6}$