

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST 2 EXAMINATION- October 2018

B.Tech VII Semester

COURSE CODE: 12M1WCE231

MAX. MARKS: 25

COURSE NAME: Prestressed Concrete Design

COURSE CREDITS: 3

MAX. TIME: One Hour thirty minutes

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

1. What is the method for analysis of prestress? (4)
2. A rectangular concrete beam of C/S 40 cm deep and 30 cm wide is prestressed by means of 15 wires of 5 mm diameter located 7.5 cm from the bottom of the beam and 3 wire of diameter of 5 mm, 3.5 cm from the top. Assuming the prestress in the steel as 860 N/mm^2 . Calculate the stresses at the extreme fibres of the mid span section when the beam is supported its own weight over a span of 7 m. If udl of 6 kN/m is imposed. Evaluate the maximum working stress in concrete. The density of concrete is 25 kN/m^3 . Assume prestress in steel = 860 N/mm^2 . (7)
3. What are the different types of losses in prestress. Explain in detail. (7)
4. A rectangular beam 300 mm wide, 200 mm deep is prestressed by means of 15 wires each 5 mm diameter wires located 65 mm from the bottom of the beam and three 5 mm wires located 25 mm from the top of the beam. If the wire are initially tensioned to a stress of 840 N/mm^2 . Calculate the percentage loss of stress in steel immediately after transfer allowing for the loss of stress due to elastic deformation of concrete only. $E_s = 210 \text{ kN/mm}^2$, $E_c = 35 \text{ kN/mm}^2$. Assume initial prestress = 840 N/mm^2 . (7)