

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- December 2017

B.Tech.- IIIrd Semester

COURSE CODE: 10B11CE311

MAX. MARKS: 35

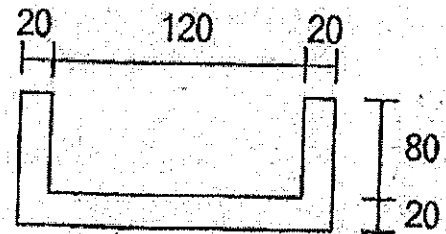
COURSE NAME: MECHANICS OF SOLIDS

COURSE CREDITS: 04

MAX. TIME: 2Hrs

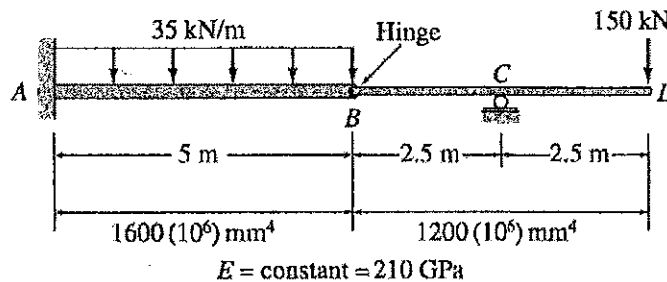
Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1. The horizontal section of simply supported beam with length 4m is shown below. If the tensile and compressive strength must not exceed 25 MPa and 45 MPa respectively, find the maximum uniformly distributed load which can be applied on the beam. All dimension of the section are in mm. (7)



Q.2. A beam of uniform section and length L is simply supported at its end and carries a symmetrical loading. The intensity of the load varies from zero to w at the centre. Find the deflection at the centre and slope at the end of the beam. (7)

Q.3. Find the slope and deflection at the section D for the given beam. (7)



Q.4. (i) Derive the shear stress formula.

(ii) A rectangular 10cm wide beam is subjected to a maximum shear force of 50000N, the corresponding maximum shear stress being 3 N/mm^2 . Find the depth of the beam. (3+4 = 7)

Q.5. The internal diameter of steel shaft is 70% of the external diameter. The shaft is to transmit 3500 kW at 200rpm. If maximum shear stress is 50MPa, calculate the diameter of the shaft. Find also the maximum angle of twist of the shaft. Length of the shaft is 4m and $G = 80 \text{ MPa}$. (7)