NAME_____ ROLLNO_____

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-2006

III B.TECH I SEMESTER REGULAR EXAMINATIONS

AIRCRAFT STRUCTURES-I

(AERONAUTICAL ENGINEERING)

NOVEMBER 2006

TIME-3HOUR

MARKS-80

ANSWER ANY FIVE QUESTIONS ALL QUESTIONS CARRY EQUAL MARKS.

1. A cantilever beam of span 5m is loaded with 50 KN at distance of 3 m from the fixed end and another load 20 KN at the free end. Find the deflection and slope at the free end using double integration method. I = 16000 × 104mm4 E = 2 × 105N/mm2

2. A cantilever beam of span 4 m is loaded with a u.d.l. of 4 KN/m over its entire span and a point load of 50 KN at a distance of 2m from the fixed end. Determine the maximum deflection and slope using superposition method. I = 20×107mm4 E = 2×105 N/mm2.

3. A propped cantilever of span L is propped at a distance L/4 from the free end and loaded at the free end by a load W. Find the prop reaction and draw the SFD and BMD.

4. (a) Derive the total strain energy stored in beam subjected to bending.

(b) Calculate the total strain energy stored in a cantilever beam of span L subjected to concentrated load, P at the free end assuming uniform flexural rigidity EI.

5. AC= CB = 3m Compute the deflection at B and C using unit load method for the cantilever beam shown 5 I=2X108mm4 E=2X105N/mm2

6. Derive Euler critical load formula for a column with one end fixed, other end free.

7. An I section of length 3 m deflects by 6.35 mm under a central point load of 10.16 KN, wen siple supported as a beam. Find the critical load when used as a column with both ends hinged. The section properties are Ixx = 468. 8×104 mm4 Iyy= 58.6×104 mm4 .

8. (a) Define beam column

(b) What are the various loadings for a beam column.