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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(ANE) (Sem.–5) AIRCRAFT STRUCTURES-II Subject Code : ANE-313 Paper ID : [A1037]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly :

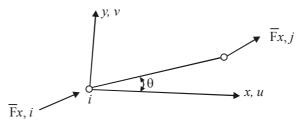
- a) State the assumptions of an Euler column.
- b) What do you mean by buckling of a column?
- c) What is difference between a plate and a column?
- d) How many boundary conditions are required to find buckling load of a column?
- e) What do you mean by effective width of a plate?
- f) What do you understand by semi-tension field beam?
- g) What are flexible and stiffness methods used in matrix method of analysis?
- h) What are properties of a stiffness matrix?
- i) What are advantages of FEM over matrix method of analysis?
- j) What is coarse grid and find grid in FEM?



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SECTION-B

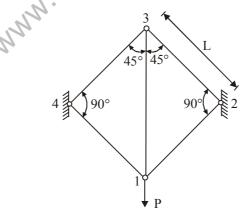
- 2. A column of length L is subjected to a compressive load P. Both ends of the column are fixed. Determine the buckling load of the column.
- 3. Write the boundary conditions for the plate of length 'a' and breadth 'b' for the following cases (i) Simply supported ends (ii) Clamped or fixed edges (iii) Free edges.
- 4. With the help of neat diagram, explain all the features of elastic buckling of curved rectangular plates.
- 5. Explain a semi tension field beam and obtain the expressions for loads in the stiffners and both the flanges of the beam.
- 6. A member of a pin-jointed frame work is shown below. Derive the expression for stiffness matrix [K_{ij}].



for the member. Forces $\overline{F}_{x,i}$ and $\overline{F}_{y,j}$ are acting along the axis of the member.

SECTION-C

- 7. A pin-ended column of length L is subjected to a compressive load P_{cr} . Obtain the expression for buckling load by energy method.
- 8. Figure below shows a square symmetrical pin-jointed truss. Develop the stiffness matrix for the truss.



9. Draw a pure tension field beam. Derive the expressions for loads in stiffner, upper and lower flanges of the beam, maximum bending moment, direct compressive stresses in flanges and stiffners

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