Code No: RT32212 **R13** SET - 1

III B. Tech II Semester Regular/Supplementary Examinations, April - 2018

AEROSPACE VEHICLE STRUCTURES –II

(Aeronautical Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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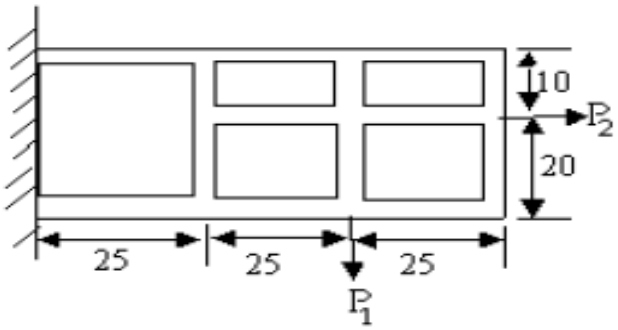
PART –A

1 a) What is tension filed beams? [3M]
b) What do you know about booms in structures? [4M]
c) Define the shear flow? [4M]
d) Identify most common sheet stringer configurations? [4M]
e) What is a sandwich construction? [3M]
f) Distinguish monocoque and semi-monocoque construction? [4M]

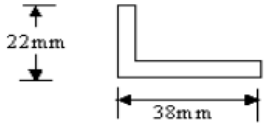
PART -B

2 a) Derive an expression for the angle of diagonal tension. [6M]
b) Derive the relationship for shear force at any section of a tapered diagonal tension field beam, subjected to a load at its free end perpendicular to the axis in the plane of the beam [10M]

3 a) What are the various types of wing structures? Show the construction of stringers and web? And types of stringers and web [4M]
b) Find the shear flow in each web of the beam shown in the figure below. Plot the distribution of axial load along each stiffening member when P_1=20kN and P_2=10kN. All dimensions are in cm. [12M]



4 a) Explain critical buckling stress for a stiffened panel and how it differs from that of a flat plate. [6M]
b) Find crippling stress for the angles shown in figure below, using Gerard's method. [10M]



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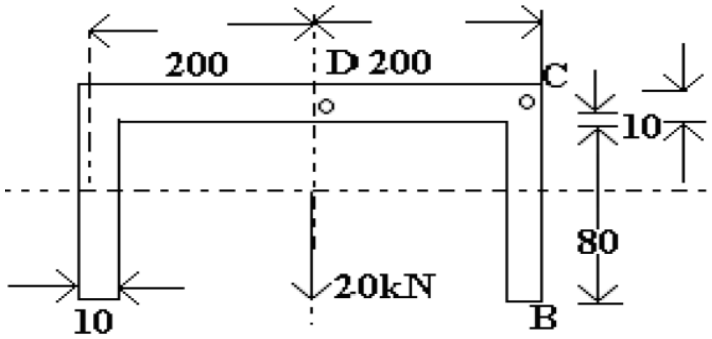
5 a) What do you mean by a sheet wrinkling, effective walls and ineffective walls? [4M]

b) A channel section is subjected to a shear of 20kN. Determine the shear flow at points B, C, D and plot the shear flow variation throughout the cross-section. Also calculate the resultant force in each region of the cross-section for the figure shown below. [12M]



6 Derive the Bredt- Batho formula related to torsion. What are the assumptions made? [16M]

7 a) Compute the torsion bending constant of channel cross-section with uniform thickness‘t’. [12M]

b) Explain in detail the stresses in the fuselage components due to air loads? [4M]

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