School of Aeronautics (Neemrana)

I-04, RIICO Industrial Area, Neemrana, Dist. Alwar, Rajasthan

Approved by Director General of Civil Aviation, Govt. of India, All India Council for Technical Education
Ministry of HRD, Govt of India & Affiliated to Rajasthan Technical University, Kota & BTU, Bikaner Rajasthan

Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 44 /

Instructions For Students / FacultyMid Term I (Total 60 Marks, 2 HRS. Syllabus From Beginning Of Session)
• Part A: Total number of questions to be given are five, each carrying 3 marks and are compulsory to attend. There is no choice. They are short answer type questions **(Not More Than 25 Words For Both Question & Answer)**, no objective type or fill in the blanks. Total 15 marks.
• Part B: Total number of questions to be given are six, out of which student has to answer any four. They are long answer type (**Not More Than 50 Words For Question)**, each carrying 6 marks. Total 24 marks.
• Part C: Total number of questions to be given are four, out of which student has to answer any three. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question)***, each carrying 7 marks. Total 21 marks.
Mid Term II & III (Total 90 Marks, 2.5 HRS. Syllabus From Beginning Of Session)
• Part A: Total number of questions to be given are ten, each carrying 2 marks and are compulsory to attend. There is no choice. They are short answer type questions **(Not More Than 25 Words For Both Question & Answer)**, no objective type or fill in the blanks. Total 20 marks
• Part B: Total number of questions to be given are seven, out of which student has to answer any five. They are long answer type (**Not More Than 50 Words For Question)**, each carrying 6 marks. Total 30 marks.
• Part C: Total number of questions to be given are five, out of which student has to answer any four. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question)***, each carrying 10 marks. Total 40 marks.

*** LIST OF ELABORATIVE THEORY QUESTION SUBJECTS**: 3 MH4 - 07 Manufacturing Process, 4 AN4 - 06 Aircraft Materials and Processes (Cr 3), 5 AN4 - 05 Aircraft System (Cr 3), 6 AN4 - 05 Avionics-I (Cr 3), 6 MH4 - 03 Applied Hydraulics & Pneumatics (Cr 3), 6 MH5 - 11 Principles of Management (Cr 3), 6 MH5 - 13 Aircraft Electronics System (Cr 3), 7 AN5 - 12 Maintenance of Airframe and System (Cr 3), 7 AN5 - 13 Helicopter Theory (Cr 3), 7 AG6 - 60.1 Human Engineering and Safety (Cr 3), 7 ST - 01 Avionics II (Special Theory Subject) (Cr 3), 7 MH5 - 11 Design of Mechatronics Systems (Cr 3), 7 MH5 - 12 Robotics and Machine Vision System (Cr 3), 7 MH6 - 13 Medical Electronics (Cr 3), 7 AN6 - 60.1 Aircraft Avionic System (Cr 3), 8 AN5 - 12 Maintenance of Power Plant and System (Cr 3), 8 AN5 - 13 Unmanned Aerial Vehicles & Systems (UAV) (Cr 3), 8 MH5 - 13 Product Development & Launching (Cr 3), 8 EC6 - 60.2 Robotics and control (Cr 3)

FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'C' OF QUESTION PAPER

Question Paper & Student Details

Mid Term	Mid Term 3	**Date of Submission**	26/09/2020
Name of Faculty	Mr. Bipin Kumar Dwivedi	**Date of Examination**	30/09/2020
Course	B.Tech (Aeronautical Engineering)	**Semester**	SEMESTER : 5
Batch	Combined Batches 15, 16, 17, SF 1	**Subject**	5 AN4 - 03 Aircraft Structures-II (Cr 3)

COURSE OUTCOMES FOR REFERENCE TO FRAME QUESTION PAPER
(Faculties are required to mention relevant Course Outcome number against the respective question in QP)

Course Outcome	COURSE OUTCOME Upon completion of the course, Students will be able to CO1: Analyse and investigate the normal stress variation on unsymmetrical sections subjected to bending moments. CO2: Determine the shear flow variation in thin walled open sections with skin effective and ineffective in bending. Also to find out the shear centre of sections. CO3: Calculate the shear flow variation in single cell and multicell tubes subjected to shear and torque loads. CO4: Investigate the behaviour of buckling of simply supported plates and also to know the effective width of sheet stringers combination. CO5: Solve the problems related to the shear and bending moment variation of aircraft wing and fuselage and also to know the characteristics of thin webbed beams.

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Student Name		**Student Reg No.**	

Part A			
Question : 1	What is product moment of inertia of T-section?		
9	unsymmetrical sections	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	1

Question : 2	Differentiate betwen shear flow and shear stress.		
11	Shear flow	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	2
Question : 3	Where is the location of shear center in T-section?		
13	Shear flow in open section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	2
Question : 4	What is the Bredt- batho formula?		
19	Shear flow in closed section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	3
Question : 5	Differentiate between critical load and safe load?		
32	Buckling of plates	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	4
Question : 6	What is a complete tension field beam?		
33	Tension field beam	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Question : 7	Define the shear stress.		
34	Tension field beam	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Question : 8	What is the load factor during manoeuvre flight?		
38	Stress analysis in wing and fuselage	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Question : 9	At what condition stiffeners of Diagonal tension field beam will buckle?		
35	Stress analysis in wing and fuselage	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Question : 10	What is gust load factor ‘n’?		
40	Gust load	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Part B			
Question : 1	Explain how to determine Maximum compressive stress of Unsymmetrical Sections.		
8	unsymmetrical sections	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	1
Question : 2	Derive and explain the shear stress distribution in thin walled T-section.		
11	Shear stress	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	2
Question : 3	Derive the expression to locate the shear center in a semi-circular thin walled section.		
15	Shear flow in open section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	2
Question : 4	Derive the expression of shear flow for double rectangular cell closed section beam under torsion.		
22	Shear flow in closed section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	3
Question : 5	Derive the expression of direct loads on top flange(FT) of Diagonal tension field beam.		
34	Tension field beam	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Question : 6	Derive the formula to Calculate the stiffener buckling load of Diagonal tension field beam.		
35	Tension field beam	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Question : 7	Explain about the Gust load envelope on V-n diagram.		
40	Gust load	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Part C			

Question : 1	Find the shear flow in BC section of the multicell tube structure Given in fig-1. Take G=25x10^5N/cm^2 and thickness t=0.1cm.		
21	Shear flow in closed section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	4
Question : 2	2 Find the shear flow in BE section of the multicell tube structure Given in fig-1. Take G=25x10^5N/cm^2 and thickness t=0.1cm.		
22	Shear flow in closed section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	4
Question : 3	Find the twist per unit length (β) of the given multicell tube structure given in fig-1. Take G=25x10^5N/cm^2 and thickness t=0.1cm.		
23	Shear flow in closed section	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	4
Question : 4	Determine the position of neutral axis from x-axis in the given L-section in Fig-3.		
11	unsymmetrical sections	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	1
Question : 5	The beam shown in Fig-2 is assumed to have a complete tension field web. If the cross-sectional areas of the flanges and stiffeners are, respectively, 350mm2 and 300mm2 and the elastic section modulus of each flange is 750mm3, determine the maximum stress in a top and bottem flang. The thickness of the web is 2mm. I=2000mm4; E =70 000 N/mm2.		
35	Stress analysis in wing and fuselage	AIRCRAFT STRUCTURES BY T.H.G. MEGSON	5
Upload Scanned Document In Case of Numerical or Diagram For Any of The Above Questions. *(Mention question number with relevant fig / numerical / equations. Max 150 KB)*			
I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.			

The message has been sent from 123.63.6.45 (India) at 2020-09-26 16:27:07 on Firefox 82.0
Entry ID: 44

MID-3 QUESTION FIGS FOR

AIRCRAFT STRUCTURE-II

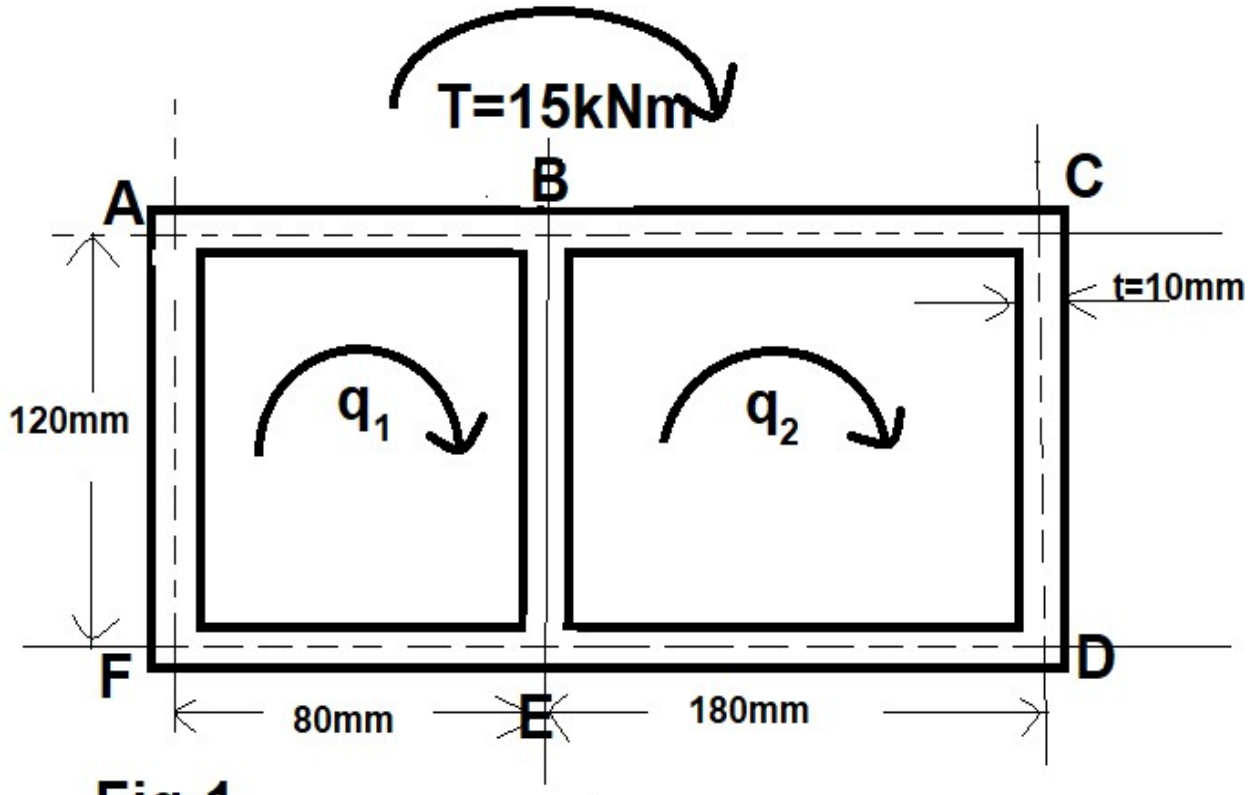

Fig-1

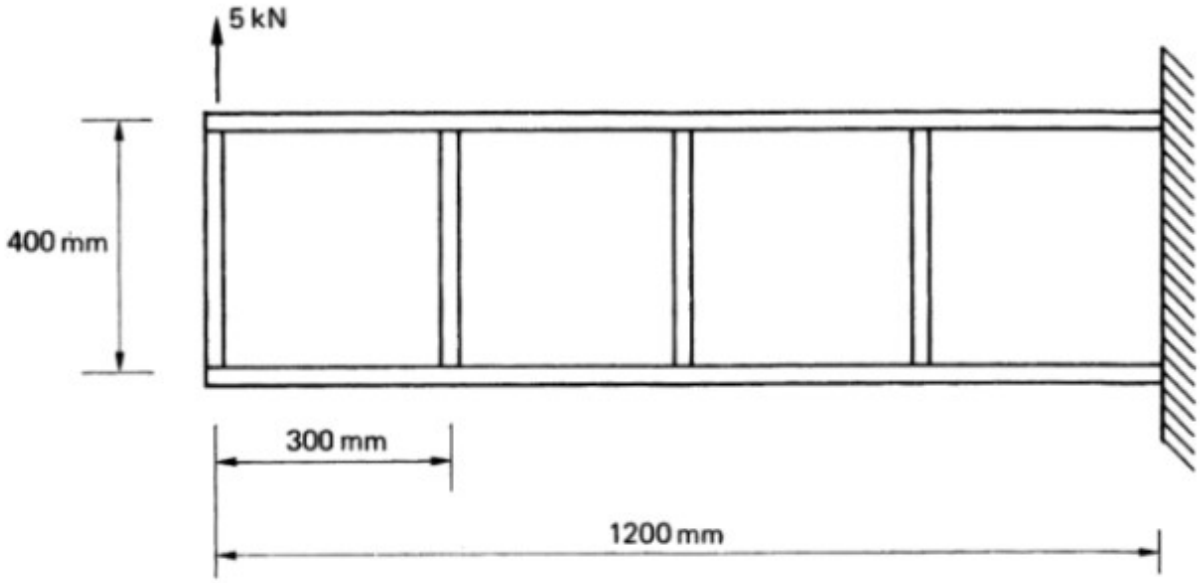

Fig-2

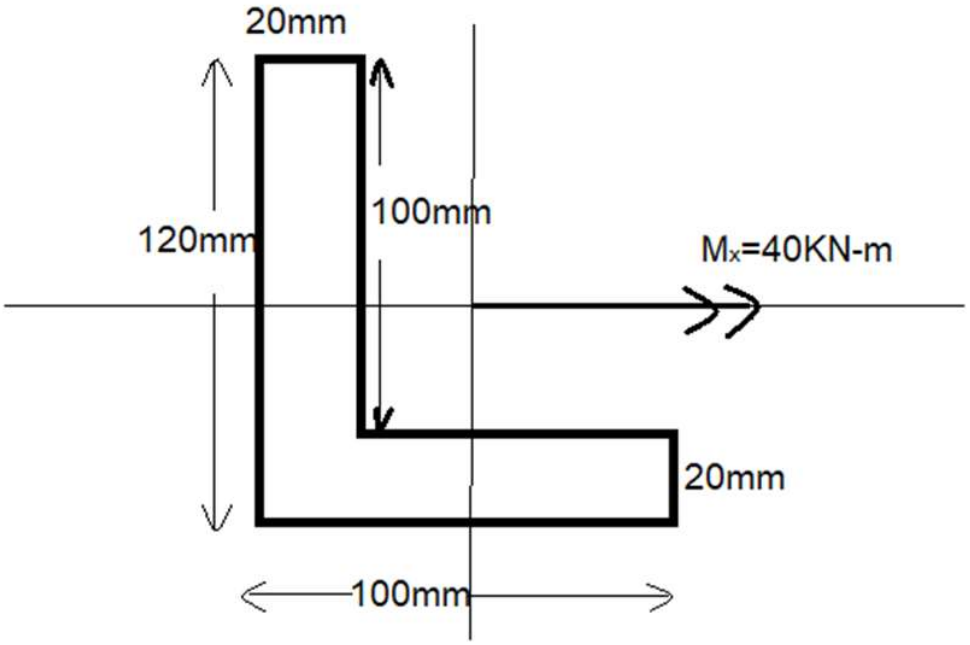

Fig-3