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 / 29 /

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

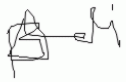
Mid Term	Mid Term 2	**Date of Submission**	20/08/2020
Name of Faculty	Mr. Bipin Kumar Dwivedi	**Date of Examination**	25/08/2020
Course	B.Tech (Aeronautical Engineering)	**Semester**	SEMESTER : 5
Batch	Combined Batches 15, 16, 17, SF 1	**Subject**	5 AN4 - 03 Aircraft Structures-II (Cr 3)

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.		
Email I'd	bipinkumardwivedi@soaneemrana.org	**Phone No.**	931-400-9035
Student Name		**Student Reg No.**	

Part A			
Question : 1	What is product moment of inertia?		
9	Unsymmetrical bending	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	1

Question : 2	What is shear flow?		
10	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 3	What is the relation between shear stress and shear flow?		
11	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 4	Why shear stress is maximum at neutral axis where bending stress is zero?		
12	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 5	Why shear stress is zero at the top of the surface where bending stress is maximum?		
13	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 6	What is shear center?		
14	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 7	What is shear modulus of elasticity 'G'?		
18	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Question : 8	What is strain energy of the closed section of beam under torsion?		
22	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Question : 9	What is shear strain of the closed section of beam under torsion?		
21	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Question : 10	What is twisting angle per unit length of the closed section of beam under torsion?		
23	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Part B			
Question : 1	Derive the expression of Principal moment of inertia of unsymmetrical section of beam.		
5	Unsymmetrical bending	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	1
Question : 2	Draw and explain the shear flow distribution in thin walled I-section.		
13	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 3	Draw and explain the shear stress distribution in thin walled T-section.		
14	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 4	Derive the expression to locate the position of shear center in thin walled semi-circular section.		
16	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 5	Derive and explain the Bredt-Batho Formula for thin walled closed section of beam under torsion.		
20	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Question : 6	Derive the expression to calculate the shear stress in thin walled semi-circular section of beam.		
16	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 7	Derive the expression of twisting angle per unit length in terms of shear flow in thin walled closed section of beam under torsion.		
23	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Part C			

Question : 1	Calculate the shear stress value at point 'C' of given T-section in fig-1.		
12	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 2	Calculate the maximum shear stress value and locate its position on the given T-section in fig-1.		
13	Shear flow in open section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	2
Question : 3	Determine the shear flow in the section AB of the given rectangular multi-cell section of beam under torsion in fig-2.		
22	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Question : 4	Determine the shear flow in the section BE of the given rectangular multi-cell section of beam under torsion in fig-2.		
22	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
Question : 5	Determine the twisting angle per unit length of the given rectangular multi-cell section of beam under torsion in fig-2.		
23	Shear flow in closed section	MECHANICS OF MATERIALS BY GERE & TIMOSHENKO	3
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)*	https://www.123formbuilder.com/upload_dld.php?fileid=1f47e5a2355efddfcb86f9d93172b32c		
I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.			

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FIGS FOR MID-2 (AIRCRAFT STRUCTURE-II) EXAM

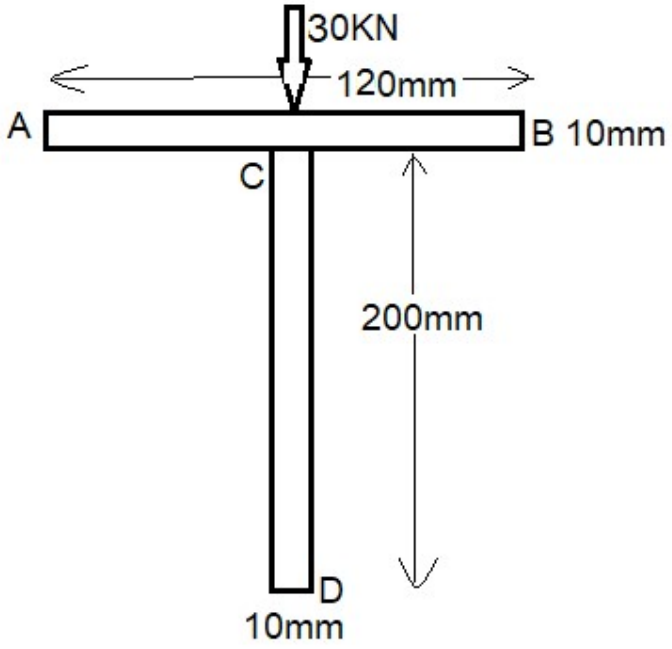

Fig-1

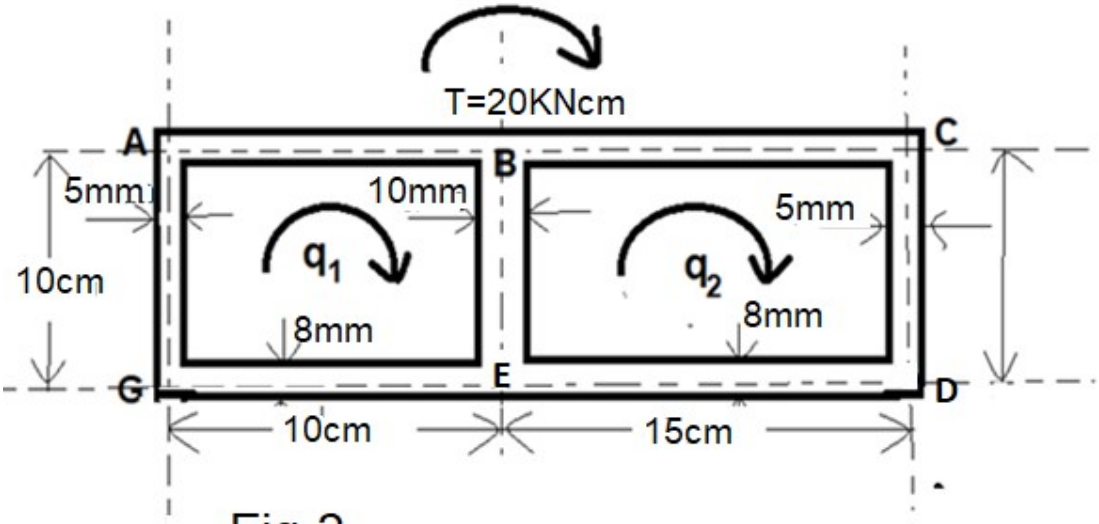

Fig-2

Take G=25x10^5N/cm^2