



**Question Paper For Internal Assessment Examination (Theory) - Credit 4 / 43 / SET 1**

**Instructions for Students/Faculty Mid Term I (Total 80 Marks, 2 HRS. Syllabus from Unit-1)**

- Part A: Total number of questions to be given are ten (5 from CO1 and 5 from CO2), 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 six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2). They are long answer type (**Not More Than 50 Words for Question**), each carrying 5 marks. Total 20 marks.
- Part C: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2). They are numerical answer type / fully elaborative type (**Not More Than 70 Words for Question**) \*, each carrying 10 marks. Total 40 marks.

**Mid Term II (Total 120 Marks, 2.5 HRS., Syllabus from Unit-2)**

- Part A: Total number of questions to be given are ten (5 from CO3 and 5 from CO4), each carrying 4 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 40 marks.
- Part B: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student has to answer four (2 from CO3 and 2 from CO4). They are long answer type (**Not More Than 50 Words for Question**), each carrying 7 marks. Total 28 marks.
- Part C: Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student has to answer four (2 from CO3 and 2 from CO4). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question**) \*, each carrying 13 marks. Total 52 marks.

**Mid Term III (Total 120 Marks, 2.5 HRS., Syllabus from Unit-3)**

- Part A: Total number of questions to be given are ten (5 from CO5 and 5 from CO6), each carrying 4 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 40 marks.
- Part B: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student must answer four (2 from CO5 and 2 from CO6). They are long answer type (**Not More Than 50 Words for Question**), each carrying 7 marks. Total 28 marks.
- Part C: Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student must answer four (2 from CO5 and 2 from CO6). They are numerical answer type / fully elaborative type (**Not More Than 70 Words for Question**) \*, each carrying 13 marks. Total 52 marks.

\* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: NO SUBJECT UNDER CREDIT FOUR

**Instructions For Faculties:**

There should be total 6 Course Outcomes (COs) for each subject.

- Mid Term Question Papers are to be submitted as per Course Outcomes (COs) which should be divided equally in Part A, Part B and Part C according to Mid Term Examination and Credit Point.
- In Mid Term-1, the questions are to be given from CO1 and CO2. In Mid Term-2, the questions are to be given from CO3 and CO4. Similarly, in Mid Term-3, the questions are to be given from CO5 and CO6.



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

**INSTRUCTION FOR STUDENTS**

- **STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM, AND MAY LEAVE THE EXAM HALL ON EXPIRY OF ATLEAST OF 1 Hr FROM THE STARTING TIME OF EXAMINATION.**

**QUESTION PAPER AND STUDENTS DETAILS**

Type of Exam	Mid Term 2	Date of Submission	23/07/2021
Name of Faculty	GOURAV SARDANA	Date of Examination	28/07/2021
Course	B.Tech (Aeronautical Engineering)	Semester	SEMESTER : 4
Batch	Eighteenth (18)	Subject	4 AN4 - 05 Aircraft Structures-I (Cr 4)

**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	3.Solve problem for deflection of beam. 4.Solve problems using Energy Methods		
Email I'd	gouravsardana@soaneemrana.org	Phone No.	925-566-9668
Student Name		Student Reg No.	

**Part A**

All the questions are compulsory to attend.

1. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.	3		
Question : 1	Explain the degree of static indeterminacy of the plane structure.		
14	Statically Indeterminate Structures	strength of Material by Sadhu singh	
Question : 2	Define fixed beam.		
15	Statically Indeterminate Structures	strength of Material by Sadhu singh	
Question : 3	Define slope of a beam?		
16	Statically Indeterminate Structures	strength of Material by Sadhu singh	
Question : 4	Explain transformation of composite beam.		



17	Statically Indeterminate Structures	strength of Material by Sadhu singh	
<b>Question : 5</b>	Explain the term weighted modulus		
15	Statically Indeterminate Structures	strength of Material by Sadhu singh	
<b>2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			4
<b>Question : 6</b>	Define Principal of virtual work .		
30	Energy Methods	strength of Material by Sadhu singh	
<b>Question : 7</b>	Define Strain Energy .		
22	Energy Methods	strength of Material by Sadhu singh	
<b>Question : 8</b>	Define Strain Energy due to bending.		
23	Energy Methods	strength of Material by Sadhu singh	
<b>Question : 9</b>	Explain the application of virtual work.		
27	Energy Methods	strength of Material by Sadhu singh	
<b>Question : 10</b>	Explain the the use of energy method.		
22	Energy Methods	strength of Material by Sadhu singh	

### Part B

**FOR MIDTERM 1 - Part B:** Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2).

**FOR MIDTERM 2 - Part B:** Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student must answer four (2 from CO3 and 2 from CO4).

**FOR MIDTERM 3 - Part B:** Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6).

<b>3. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			3
<b>Question : 1</b>	Drive the expression for fixed beam with isolated load at mid span through Macaulay.		
16	Statically Indeterminate Structures	Strength ofMaterial by Sadhu singh	
<b>Question : 2</b>	Drive the expression for Clapeyron		
20	Statically Indeterminate Structures	Strength ofMaterial by Sadhu singh	



<b>Question : 3</b>	Drive the expression for Bending Stress Formula .		
22	Statically Indeterminate Structures	Strength of Material by Sadhu Singh	
<b>4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			4
<b>Question : 4</b>	Drive the Expression for Principal of virtual work .		
25	Energy Methods	Engineering Mechanics by R.S Khurmi	
<b>Question : 5</b>	Verify the Maxwell Reciprocal theorem for Cantilever Beam.		
27	Energy Methods	Strength of material by Sadhu Singh	
<b>Question : 6</b>	Drive the expression for Strain energy due to axial load.		
26	Energy Methods	Strength of material by Sadhu Singh	
<b>Question : 7 (Old Pattern)</b>			
<b>Part C</b>			
<p><b>FOR MIDTERM 1 - Part C:</b> Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student must answer four (2 from CO1 and 2 from CO2).</p> <p><b>FOR MIDTERM 2 - Part C:</b> Total number of questions to be given are six (3 from CO3 and 3 from CO4), out of which student must answer four (2 from CO3 and 2 from CO4).</p> <p><b>FOR MIDTERM 3 - Part C:</b> Total number of questions to be given are six (3 from CO5 and 3 from CO6), out of which student has to answer four (2 from CO5 and 2 from CO6).</p>			
<b>5. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			3
<b>Question : 1</b>	Draw the BM and SF diagram for continuous beam ( Clapeyron)		
22	Statically Indeterminate Structures	Strength of material by Sadhu Singh	
<b>Question : 2</b>	Drive the expression for Fixed beam with UDL by Moment area Method.		
21	Statically Indeterminate Structures	Strength of material by Sadhu Singh	
<b>Question : 3</b>	A wooden beam is 8 cm wide and 12 cm deep with a semi-circular groove of 2 cm radius planned out i the centre of each side. Calculate the maximum stress in the section when simply supported on a span of 3 m loaded with a load of 450 N at a distance of 1 m from the one end and UDL of 500N/M run over the span		
20	Statically Indeterminate Structures	Strength of material by Sadhu Singh	



**6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.**

4

**Question : 4**

A beam 4 length is simply supported at the ends and carries a UDL of 5KN/m length ,Determine the Strain Energy stored in the beam .  $E = 200\text{GPa}$  ,  $I = 1200\text{ cm}^4$

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Energy Methods:

Strength of Material by  
sadhur Singh

**Question : 5**

Two Beams AC and CD of length 9m and 10m are hinged at C .These are supported on rollers at the left and right ends ( A and D). A hinged support is provided at B ,7 m from A .Using Principle of Virtual work determine the reaction at the hinge C and the support B when the load of 700N acts at a point 6m from D.

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Energy Methods:

Engineering  
Mechanics by R S  
khurmi

**Question : 6**

Derive the expression for Castigliano Theorem .

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Energy Methods:

Engineering  
Mechanics by R S  
khurmi

**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.**

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