School of Aeronautics (Neemrana)

Question Paper For Internal Assessment Examination (Theory) - Old Scheme i.e 2012 Syllabus

Instructions For Students / Faculty

Mid Term I (Total 40 Marks, 1 Hr. & 30 Min, Syllabus From Beginning of The Session)

Total number of questions to be given are 8, each carrying 10 marks and it is compulsory to attend 2 questions from each part i.e. Part A and B. There is a choice of two questions out of four in each part. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

Mid Term II (Total 50 Marks, 1 Hr. & 45 Min, Syllabus From Beginning of The Session)

Total number of questions to be given are 8, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and three questions from Part B. There is a choice of two questions out of four in part A and 3 questions out of 4 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

Mid Term III (Total 60 Marks, 2 Hrs, Syllabus From Beginning of The Session)

Total number of questions to be given are 10, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and 4 questions from Part B. There is a choice of two questions out of four in part A and 4 questions out of 6 in Part B. Part A will be theoretical or derivation type **(Not More Than 70 Words For Question).** Part B will be fully numerically oriented questions **(Not More Than 70 Words For Question)**, except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

*** LIST OF ELABORATIVE THEORY QUESTION SUBJECTS**: Aircraft Materials, Aircraft System, Aircraft Rules & Regulation-I, Mechanics of Composite Materials, Aircraft Design, Aircraft Rules & Regulation-II, Avionics-I, Helicopter Theory, Maintenance of Airframe and System Design, Avionics-II, Airlines and Airport Management, Maintenance of Power Plant & Systems

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

STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF

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 & Student Details

Mid Term*	Mid Term 1	**Date of Submission of QP**	07/09/2019
Name of Faculty*	Varsha	**Date of Examination***	09/09/2019
Subject*	7AN2 - Finite Element Methods (Old)	**Course***	B.Tech (Aeronautical Enginee...
Batch	Combined Batches 10,11	**Semest...**	Semester : 7
Email Id of Faculty:*	svarsha2631@gmail.com	**Phone Number of Faculty***	935 106 2262

Student Name		**Student Reg No.**	

Part A

Question : 1* What is finite element method , explain FEM steps with example and write its applications?

Lesson Plan*	1	**Topic***	Introduction to finite ele	**Source***	Introduction to fin

Question : 2* What is local and global stiffness matrix and write the properties of stiffness matrix and proof the properties with example?

Lesson Plan*	3	**Topic***	Stiffness matrix	**Source***	Finite element Ana

Question : 3*	Write about simplification techniques used in the calculation of matrix. Explain it with example?				
Lesson Plan*	5	**Topic***	Gauss elimination meth(	**Source***	Finite Element Ana
Question : 4*	(a) Write short notes on boundary conditions? (b) What is Symmetric Banded Matrix and how it affect the storage of computer. Explain it?				
Lesson Plan*	6	**Topic***	Gauss elimination meth(	**Source***	Finite Element Me

Part B

Question : 1*	Consider the four bar truss shown in fig.1. It is given that E=29.5 * 〖 10〗 ^6 psi. and area A = 1 in^2 for all the element. complete the following: (a) Determine the element stiffness matrix for each element. (b) Find the global stiffness matrix. (c) find nodal displacement and reaction forces?				
Lesson Plan*	7	**Topic***	Two Force Member	**Source***	P. Seshu, Chandra
Question : 2*	For the three - bar truss in fig.2 , Determine the displacements of node 1 and stress in element 3 ?				
Lesson Plan*	8	**Topic***	Two Force Member	**Source***	Chandrapatla, Thi

Question : 3*

For the two bar truss in fig. 3, determine the displacements of node 1 and the stress in element 1-3 ?

Lesson Plan* 8 **Topic*** Two Force Member **Source*** Chandrapatla, thir

Question : 4*

For tapered bar of uniform thickness t=10 mm as shown in fig.4 , Find the displacement at the nodes by forming into

two element model. The bar has mass density 7800 kg/m^3, young\

Lesson Plan* 8 **Topic*** 1 bar element **Source*** Chandrapatla, thir

Question : 5

Lesson Plan **Topic** **Source**

Question : 6

Lesson Plan **Topic** **Source**

Upload Scanned Document In Case of Numerical or Diagram for any of the above question

Mention question number with relevant fig / numerical / equations. Max 150 KB

Choose files or drag here

I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.

School of Aeronautics (Neemrana)

Question Paper For Internal Assessment Examination (Theory) Diagram Sheet

Faculties preparing Question Paper for various examinations, need to draw or insert diagrams as per requirement of questions in the below format and upload the same in upload documents column of the question paper.

Question Paper & Student Details

Mid Term *	Mid Term-1	Date of Submission of QP	10/5/2019
Name of Faculty *	Varsha	Date of Examination *	07/09/19
Subject *	7AN2-Finite Element Methods (Old)	Course*	B.Tech (Aeronautical Engg)
Batch	Batch-10, 11	Semester *	VII
Email Id of Faculty:*	Svarsha2631@gmail.com	Phone Number of Faculty*	9351062262
Student Name		Student Reg No.	

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Part No. _B__, Question Number __1__ .

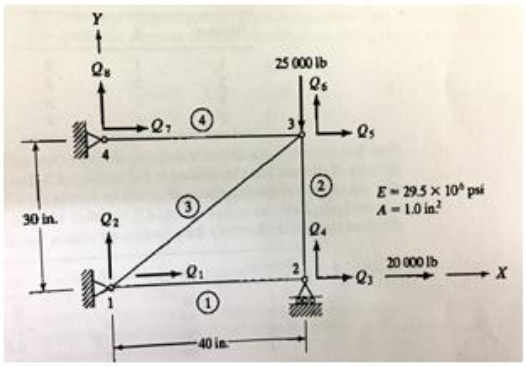

Fig. 1

Part No. _B__, Question Number _2__ .

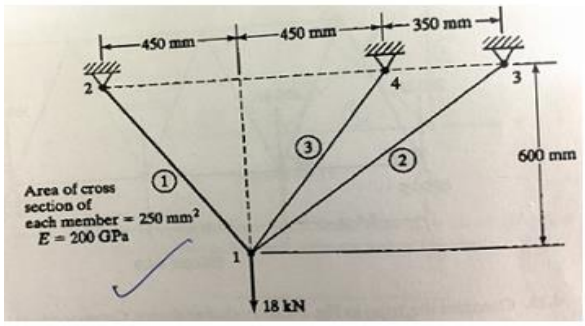

Fig. 2

Part No. _B__, Question Number _3___ .

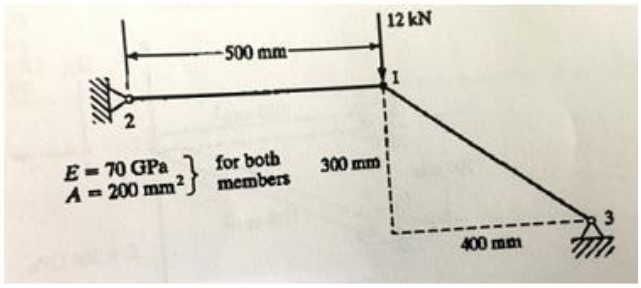

Fig. 3

Part No. _B__, Question Number __4__ .

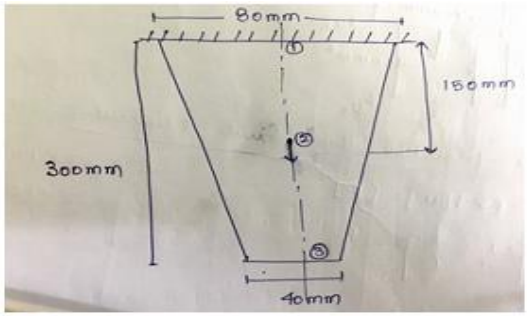

Fig. 4

Answer Sheet Details	
Mid Term	Mid Term 1
Name of Faculty	Varsha
Subject	7AN2 - Finite Element Methods (Old)
Date of Submission of QP	17/09/2019
Batch	Tenth (10)
Email Id of Faculty:	svarsha2631@gmail.com
Date of Examination	10/09/2019
Course	B.Tech (Aeronautical Engineering)
Semester	Semester : 7
Phone Number of Faculty	935-106-2262

Part A	
Question : 1	1. Explain about Finite Element Method. 2. Write the steps of finite element Method. 3. Explain the steps with the help of example. 4. Write advantages of Finite Element Method. Applications of FEM 1. FEM have been widely used in the mechanical design of automobile parts, such as the lightweight design of automotive frame and the analysis of frame and body vibration characteristics, which can effectively solve the problem of the whole deformation and stress distribution of complex parts. 2. FEM also provides a strong support for the strength and stiffness analysis design of the transmission shell, suspension systems, brake systems, wheels and other auto parts . 3. FEM is used to analyze stress condition under different working conditions, which effectively improves the design efficiency and reduces the calculation error. 4. Finite element analysis (FEA) is an extremely useful tool in the field of civil engineering for numerically approximating physical structures that are too complex for regular analytical solutions
Question : 2	1. First explain the Local and global stiffness matrix with the help of example. 2. Explain the properties of stiffness matrix with example. 3. Write physical significance of stiffness matrix. 4. Taking example of step bar or truss member.
Question : 3	There are two simplification techniques used in the calculation of matrix: 1. Guass Elimination method 2. Penalty Approach. Explain it with the help of example.

Question : 4	Boundary condition 1. Define Boundary condition. 2. Explain the types of boundary conditions with the help of example like fixed support, roller support, point load at the end of bar, boundary condition in two force member. Symmetric Banded Matrix 1. Define Banded Matrix 2. Formula 3. Effect of Node numbering 4. How it affect the storage of computer by taking example.
Part B	
Question : 1	1. Node Element table 2. Nodal coordinate Table 3. Table of direction cosines. 4. Stiffness Matrix for element 5. Global Stiffness matrix 6. Apply boundary conditions
Question : 2	1. Node Element table 2. Nodal coordinate Table 3. Table of direction cosines. 4. Stiffness Matrix for element 5. Global Stiffness matrix 6. Apply boundary conditions 7. u(1y)= 187.11mm u(1x)= 56.133mm stress= 30KN/mm^2
Question : 3	1. Node Element table 2. Nodal coordinate Table 3. Table of direction cosines. 4. Stiffness Matrix for element 5. Global Stiffness matrix 6. Apply boundary conditions 7. u(1x)= 0.571mm u(1y)= 1.952mm stress= 100.0529 N/mm^2
Question : 4	1. Find Cross sectional Area 2. Stiffness Matrix 3. Global stiffness matrix 4. Find force at each nodes 5. Apply boundary conditions 6. Reaction = 3.73 N u(3)= 1.513 * 10^(-6)m
Question : 5	
Question : 6	
Upload Scanned Document In Case of Numerical or Diagram for any of the above question	
I have scrutinized the answer sheet. There is no spelling mistake or any type of irrelevant answers.	

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http://www.123formbuilder.com/sfnew2.php?redirect=true&s=5017221&loadsubm=x5d83145a8489c7.85034103&targetAction=saveForLater