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& BIKANER TECHNICAL UNIVERSITY, BIKANER, RUN & MANAGED BY L N VERMA MEMORIAL SOCIETY | DELHI ADMINISTRATION, UNDER SOCIETIES REGISTRATION ACT XXI OF 1860.

Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 66 /

NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA

Instructions for Students / Faculty

Mid Term I (Total 60 Marks, 2 HRS. Syllabus from Unit-1)

- Part A: Total number of questions to be given are six (3 from CO1 and 3 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 12 marks.

- Part B: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student has to answer four (2 from CO1 and 2 from CO2). They are long answer type (**Not More Than 50 Words for Question)**, each carrying 4 marks. Total 16 marks.

- Part C: Total number of questions to be given are six (3 from CO1 and 3 from CO2), out of which student has to 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 8 marks. Total 32 marks.

Mid Term II (Total 90 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 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 30 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 6 marks. Total 24 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 any 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 9 marks. Total 36 marks.

Mid Term III (Total 90 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 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 30 marks

- 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). 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 six (3 from CO5 and 3 from CO6), out of which student has to 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 9 marks. Total 36 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

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(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)

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,**

QUESTION PAPER & STUDENTS DETAILS

Type of Exam	Mid Term 2	Date of Submission	01/02/2021
Name of Faculty	Mr. Rahul Dev Bairwan	Date of Examination	06/02/2021
Course	B.Tech (Aeronautical Engineering)	Semester	SEMESTER : 3
Batch	Combined Batches 18, 19, SF 2	Subject	3 AN4 - 06 Mechanics of Solids (Cr 3)

COURSE OUTCOMES FOR REFERENCE TO FRAME QUESTION PAPERS
(Faculties are required to mention Course Outcome Number against each part of the question paper)

Course Outcome	CO3: Construct Shear Force, Bending moment and Bending stress distribution in beams subjected to transverse load. CO4: Determine the deflection of statically determinant beam.
Email I'd	rahuldevbairwan@soaneemrana.org	Phone No.	945-634-1170
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.	CO 3
Question : 1	Discuss the concept behind finding transverse shear stress.

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20	Transverse shear stress	Strength of materials by S. S. Bhavikatti	
Question : 2	Define roller support.		
13	Beams	Strength of materials by S. S. Bhavikatti	
Question : 3	Define pure bending.		
17	Bending stress	Strength of materials by S. S. Bhavikatti	
Question : 4	Differentiate between statically determinate and statically indeterminate structures.		
13	Beams	Strength of materials by S. S. Bhavikatti	
Question : 5	Define shear force & bending moment.		
15	Shear force and bending moment diagrams	Strength of materials by S. S. Bhavikatti	
2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.		CO 4	
Question : 6	List out advantages of using Macaulay's method?		
24	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 7	List some methods to compute deflections in beam?		
21	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 8	Write the expression for slope and deflection of a cantilever beam with a point load at free end.		
22	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 9	Define moment area method.		
25	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 10	Define singularity function.		
24	Deflection of beams	Strength of materials by S. Ramamrutham,	

PART B

NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA

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).

3. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			CO 3
Question : 1	Mention the types of beams, with diagrams.		
13	Beams	Strength of materials by S. S. Bhavikatti	
Question : 2	State the assumptions in theory of bending.		
17	Bending stress	Strength of materials by S. S. Bhavikatti	
Question : 3	Draw the shear force and bending moment diagram for simply supported beam of span l with a uniformly distributed load of W kN/m.		
14	Beams	Strength of materials by S. S. Bhavikatti	
4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			CO 4
Question : 4	Derive the expression for slope and deflection of a cantilever beam with UDL over its whole length.		
22	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 5	Write the procedure to solve the problem by Macaulay's method.		
24	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 6	A cantilever beam carries a load W uniformly distributed over its entire length. If the same load is placed at the free end of the same cantilever, then the ratio of maximum deflection in the first case to that in the second case will be?		
22	Deflection of beams	Strength of materials by S. Ramamrutham,	
Question : 7 (Old Pattern)			
PART C			

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FOR MIDTERM 1 - 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).
FOR MIDTERM 2 - Part C: 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 C: 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).

5. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.		CO 3
Question : 1	Derive bending equation.	
17	Stress in beams	Strength of materials by S. S. Bhavikatti
Question : 2	A simply supported beam of span 3.0 m has a cross-section 120 mm × 180 mm. If the permissible stress in the material of the beam is 10 N/mm^2, determine (i) maximum udl it can carry (ii) maximum concentrated load at a point 1 m from support it can carry. Neglect moment due to self weight.	
18	Stress in beams	Strength of materials by S. S. Bhavikatti
Question : 3	Calculate the shear force and bending moment for the simply supported beam subjected to a concentrated load at mid point then draw the shear force diagram (SFD) and bending moment diagram (BMD).	
16	Beams	Strength of materials by S. S. Bhavikatti
6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.		CO 4
Question : 4	A cantilever beam carries a load W uniformly distributed over its entire length. If the same load is placed at the free end of the same cantilever, then the ratio of maximum deflection in the first case to that in the second case will be?	
22	Deflection of beams	Strength of materials by S. Ramamrutham,
Question : 5	A simply supported beam carrying a concentrated load W at mid-span deflects by δ_1 under the load. If the same beam carries the load W such that it is distributed uniformly over entire length and undergoes a deflection δ_2 at the mid span. Calculate the ratio of $\delta_1 : \delta_2$.	
23	Deflection of beams	Strength of materials by S. Ramamrutham,
Question : 6	A beam of uniform section is 10 m long and is simple supported at the ends. It carries concentrated loads of 10t and 6t a a distance of 2 m and 5 m respectively from the left end. Calculate the deflection under each load. Find also the maximum deflection. Take I = 18 * 10^4 cm^4 and E = 2 * 10^3 kg/cm^2.	
24	Deflection of beams	Strength of materials by S. Ramamrutham,

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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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