



Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 95 /

**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



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 95 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

(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**

<b>Type of Exam</b>	Mid Term 1	<b>Date of Submission</b>	22/03/2021
<b>Name of Faculty</b>	Mr. Challa Rudesh	<b>Date of Examination</b>	22/03/2021
<b>Course</b>	B.Tech (Aeronautical Engineering)	<b>Semester</b>	SEMESTER : 6
<b>Batch</b>	Combined Batches 15, 16, 17, SF 1	<b>Subject</b>	6 AN4 - 03 Aircraft Stability and Control (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)



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 95 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

<b>Course Outcome</b>	6 AN4 - 03 Aircraft Stability and Control (credit-3) COURSE OBJECTIVE 1. To familiarize the student, the generalized concepts of stability and control in an aircraft. 2. To gain knowledge in the concept of static longitudinal stability and control derivatives, and criteria for a stable airplane. 3. To estimate the maneuvering stability of an aircraft. 4. To Impart theoretical knowledge on the static lateral and directional stability and control derivatives, and criteria for a stable airplane. 5. To carry out the various dynamic instabilities of an aircraft motion. 6. To get exposure on the need and aspects of aerodynamic balancing.
	COURSE OUTCOME Upon completion of the course, Students will be able to CO 1. Analyze and investigate the generalized concepts of stability and control in an aircraft. CO 2. Determine the concept of static longitudinal stability and control derivatives, and criteria for a stable airplane. CO 3. Calculate the maneuvering stability of an aircraft. CO 4. Investigate the behavior on the static lateral and directional stability and control derivatives, and criteria for a stable airplane. CO 5. Solve the various dynamic instabilities of an aircraft motion. CO 6. Apply aspects of aerodynamic balancing ideas to solve the practical problems in the society.

<b>Email I'd</b>	prudesh@soaneemrana.org	<b>Phone No.</b>	832-860-7582
<b>Student Name</b>		<b>Student Reg No.</b>	

**PART A****All the questions are compulsory to attend.**

<b>1. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>	CO 1
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<b>Question : 1</b>	Define what is meant by static stability.		
01	static stability.	stability and control by Nelson	
<b>Question : 2</b>	Define dynamic stability.		
01	Dynamic stability.	stability and control by Nelson	
<b>Question : 3</b>	Write down the primary controls and secondary controls of an aircraft.		
02	static stability.	stability and control by Nelson	
<b>Question : 4</b>			



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 95 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

Question : 5

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

CO 2

Question : 6

Define stick fixed neutral point.

02

Neutral point.

stability and control by  
Nelson

Question : 7

Define trim point at trim angle of attack of an airplane.

03

Trim point.

stability and control by  
Nelson

Question : 8

Discuss about the condition for longitudinal static stability ?

03

LSS

stability and control by  
Nelson

Question : 9

Question : 10

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

CO 1

Question : 1

Explain how does wing contribution will be there for longitudinal static stability?

04

Longitudinal static stability

stability and control by  
Nelson

Question : 2

Discuss about the importance's of aerodynamics center IN LSS.

04

Longitudinal static stability

stability and control by  
Nelson

Question : 3

Derive the relation for static margin? explain your understanding about the importance of it in LSS.

05

static margin

stability and control by  
Nelson



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 95 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA****4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.**

CO 2

**Question : 4**

Explain how the tail contribution for longitudinal static stability?

05

Longitudinal static stability

stability and control by  
Nelson**Question : 5**

Discuss about degree of freedom? How many degrees of freedom an aircraft has?

06

Degree of freedom

stability and control by  
Nelson**Question : 6**

Describe the static stability conditions about the three axis of an airplane.

06

static stability

stability and control by  
Nelson**Question : 7 (Old Pattern)****PART C****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 1

**Question : 1**a) A wing alone arrangement has wing lift curve slope of 2.65 per rad. Find slope of pitching moment coefficient. Given  $X_{cg} = 0.3$ .b) If moment coefficient about aerodynamic centre of wing is  $-0.216$  and lift coefficient of wing is 1.2. Find moment coefficient about cg. Given cg location as  $X_{cg} = 0.3$ .

07

Longitudinal static stability

stability and control by  
Nelson**Question : 2**a) If  $CL_{\alpha} \text{ wing} = 1.2$  per rad then, determine  $CM_{\alpha}$ . Given  $X_{cg} = 0.29$ .b) A wing alone aircraft has aerodynamic centre pitching moment coefficient of  $-0.126$ . If lift coefficient at zero AOA is 0.38 then, find  $Cm_0$ . Consider  $X_{cg} = 0.3$ .

07

Longitudinal static stability

stability and control by  
Nelson**Question : 3**

a) An aircraft with wing aft tail configuration has tail efficiency of 0.95 and tail volume ratio of horizontal tail is 0.7. Determine pitching moment coefficient slope for the tail. Given lift curve slope of tail is 4.2 per rad. Consider downwash derivative as 0.6.

b) Find tail efficiency if, dynamic pressure at tail and wing is 25Pa and 28Pa respectively.



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 95 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEEMRANA**

08	Longitudinal static stability	stability and control by Nelson	
<b>6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			CO 2
<b>Question : 4</b>	<p>a) An aircraft wing is experiencing AOA of <math>5^\circ</math>. If downwash due to wing is <math>2.6^\circ</math> then, how much angle is being seen by tail of the aircraft</p> <p>b) If an aircraft has lift curve slope of 4.76 per rad and moment coefficient curve slope of -0.116 per rad then, find the location of neutral point. Consider <math>X_{cg}=0.3</math>.</p>		
08	Longitudinal static stability	stability and control by Nelson	
<b>Question : 5</b>	<p>a) The wing tail setting angles are 3 and 1.5 respectively. if the wing is at 10 degree angle of attack and tail is at 6 degree angle of attack calculate the downwash angle for his angle.</p> <p>b) if the static margin of an aircraft please 90% mac and its CG is located at 10 of mac find the neutral point location for this aircraft</p>		
09	Longitudinal static stability	stability and control by Nelson	
<b>Question : 6</b>	<p>If <math>CM_0</math> is -0.052 and lift coefficient at zero angle <math>CL_0</math> is 0.92 then, find <math>CMac</math>. Consider rectangular wing.</p> <p>b) An aircraft wing is experiencing AOA of <math>6^\circ</math>. If downwash due to wing is <math>2.6^\circ</math> then, how much angle is being seen by tail of the aircraft</p>		
10	Longitudinal static stability	stability and control by Nelson	
<b>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)</b>			
<b>I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.</b>			
<b>Corporate Office: H 974, Palam Extension, Part: 1, Sector: 7, Dwarka, New Delhi</b>			



Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 80 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEW DELHI**

**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)**

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- 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.

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## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 80 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEW DELHI**(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 1	Date of Submission	15/03/2021
Name of Faculty	Sonali Singh	Date of Examination	23/03/2021
Course	B.Tech Engineering) (Aeronautical	Semester	SEMESTER : 6
Batch	DS - 2018	Subject	6 AN4 - 03 Aircraft Stability and Control (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	<p>COURSE OUTCOME</p> <p>Upon completion of the course, Students will be able to</p> <p>CO 1. Analyze and investigate the generalized concepts of stability and control in an aircraft.</p> <p>CO 2. Determine the concept of static longitudinal stability and control derivatives, and criteria for a stable airplane.</p> <p>CO 3. Calculate the maneuvering stability of an aircraft.</p> <p>CO 4. Investigate the behavior on the static lateral and directional stability and control derivatives, and criteria for a stable airplane.</p> <p>CO 5. Solve the various dynamic instabilities of an aircraft motion.</p> <p>CO 6. Apply aspects of aerodynamic balancing ideas to solve the practical problems in the society.</p>		
Email I'd	sonali@soaneemrana.org	Phone No.	900-324-6157
Student Name		Student Reg No.	

**PART A**





Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 80 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEW DELHI**

All the questions are compulsory to attend.

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

CO 1

**Question : 1** Define static and dynamic stability

2	Stability	Aircraft stability and control By Robert b. nelson	
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**Question : 2** Define orientation of the airplane.

3	Axis of reference and notation	Aircraft stability and control By Robert b. nelson	
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**Question : 3** Define longitudinal and lateral stability

4	Longitudinal, Lateral and Directional Stability and Control.	Aircraft stability and control By Robert b. nelson	
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**Question : 4**

**Question : 5**

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

CO 2

**Question : 6** Write stability criterion.

5	Basic equations of equilibrium, Stability criterion	Aircraft stability and control By Robert b. nelson	
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**Question : 7** Define horizontal tail incidence angle

6	Wing and Tail moments	Aircraft stability and control By Robert b. nelson	
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**Question : 8** Write change in pitching moment with angle of attack of fuselage.

7	Effect of fuselage and nacelles	Aircraft stability and control By Robert b. nelson	
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**Question : 9**

**Question : 10**



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 80 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEW DELHI****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).

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

CO 1

**Question : 1**

Discuss about primary and secondary control surfaces

1

Introduction

Aircraft stability and control By Robert b. nelson

**Question : 2**

Briefly explain about stable and unstable dynamic motions.

2

Dynamic stability

Aircraft stability and control By Robert b. nelson

**Question : 3**Write short notes on:  
a. Longitudinal Stability  
b. Lateral Stability  
c. Directional stability

4

Longitudinal, lateral and directional stability and control

Aircraft stability and control By Robert b. nelson

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

CO 2

**Question : 4**

Briefly explain about canard-forward tail surface.

6

Wing and Tail moments

Aircraft stability and control By Robert b. nelson

**Question : 5**

Discuss about the stability effects of a nacelle.

7

Effect of fuselage and nacelles

Aircraft stability and control By Robert b. nelson

**Question : 6**

Discuss about power effects in aircraft stability

8

Power effects

Aircraft stability and control By Robert b. nelson



## Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 80 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEW DELHI****Question : 7 (Old Pattern)****PART C****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 1

**Question : 1**

Explain in detail about degrees of freedom of a rigid body airplane.

1

Degrees of Freedom of A System

Aircraft stability and control By Robert b. nelson

**Question : 2**

Explain in detail about contribution of aircraft components.

3

Aircraft stability control, simplifying assumptions

Aircraft stability and control By Robert b. nelson

**Question : 3**

Explain in detail about directional stability and control.

4

Directional Stability and Control

Aircraft stability and control By Robert b. nelson

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

CO 2

**Question : 4**

Derive the expression for equations of equilibrium.

5

Basic equations of equilibrium, Stability criterion

Aircraft stability and control By Robert b. nelson

**Question : 5**

Derive the expression for wing contribution.

6

Wing and tail moments

Aircraft stability and control By Robert b. nelson

**Question : 6**

Derive the expression for change in pitching moment with angle of attack of a fuselage.

7

Effect of fuselage and nacelles

Aircraft stability and control By Robert b. nelson



**School of Aeronautics (Neemrana)**

APPROVED BY DIRECTOR GENERAL OF CIVIL AVIATION, MINISTRY OF CIVIL AVIATION, GOVT. OF INDIA  
APPROVED BY ALL INDIA COUNCIL FOR TECHNICAL EDUCATION & AFFILIATED TO RAJASTHAN TECHNICAL UNIVERSITY, KOTA  
& BIHARER TECHNICAL UNIVERSITY, BIHARER, RUN & MANAGED BY L. N. VERMA MEMORIAL SOCIETY

**School of Aeronautics**



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RUN AND MANAGED BY LAXMI NARAIN VERMA MEMORIAL SOCIETY, REGISTERED,  
DELHI ADMINISTRATION, UNDER SOCIETIES REGISTRATION ACT XXI OF 1980.

Question Paper For Internal Assessment Examination (Theory) - Credit 3 / 80 /

**NAME OF STUDY CENTER: SCHOOL OF AERONAUTICS, NEW DELHI**

**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.**

**Corporate Office: H 974, Palam Extension, Part: 1, Sector: 7, Dwarka, New Delhi**