

# 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 2 / 71

### Instructions for Students / Faculty

#### Mid Term I (Total 40 Marks, 1.5 HRS., Syllabus from Unit-1)

- Part A: Total number of questions to be given are four (2 from CO1 and 2 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 8 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 Only**), each carrying 4 marks. Total 16 marks.
- Part C: Total number of questions to be given are four (2 from CO1 and 2 from CO2), out of which student has to answer two (1 from CO1 and 1 from CO2). They are numerical answer type / fully elaborative type\* (**Not More Than 70 Words for Question Only**), each carrying 8 marks. Total 16 marks.

#### Mid Term II (Total 60 Marks, 2 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 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 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 Only**), each carrying 4 marks. Total 16 marks.
- Part C: Total number of questions to be given are four (2 from CO3 and 2 from CO4), out of which student has to answer any two (1 from CO3 and 1 from CO4). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question Only**)\*, each carrying 12 marks. Total 24 marks.

#### Mid Term III (Total 60 Marks, 2 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 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 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 Only**), each carrying 4 marks. Total 16 marks.
- Part C: Total number of questions to be given are four (2 from CO5 and 2 from CO6), out of which student has to answer any two (1 from CO5 and 1 from CO6). They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question Only**)\*, each carrying 12 marks. Total 24 marks.

\* LIST OF ELABORATIVE THEORY QUESTION SUBJECTS: 1 FY1 - 04 Communication Skills (Cr 2), 1 FY1 - 05 Human Values (Cr 2), 2 FY1 - 04 Communication Skills (Cr 2), 2 FY1 - 05 Human Values (Cr 2), 3 AN1 - 02 Technical Communication (Cr 2), 4 MH1 - 02 Technical Communications (Cr 2), 4 MH1 - 03 Economics and Financial Accounting (Cr 2), 5 AN5 - 12 Aircraft Maintenance Practices (Cr 2), 6 AN3 - 01 Mechanics of Composite Materials (Cr 2), 6 AN5 - 12 Aircraft Rules and Regulation (Cr 2), 6 MH3 - 01 Automobile Engineering (Cr 2).

### 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 & Student Details

Type of Exam	Mid Term 1	Date of Submission	09/01/2021
Name of Faculty	Mr. Maris Brightson	Date of Examination	13/01/2021
Course	B.Tech (Aeronautical Engineering)	Semester	SEMESTER : 3
Batch	Eighteenth (18)	Subject	3 AN4 - 05 Introduction to Aeronautics (Cr 2)

### 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	CO1: Describe the classification and working principles of different types of flight vehicles and their components. CO2: Illustrate the basic principles of aerodynamics, characteristics of airfoils, and NACA numbering system for the airfoil. CO3: Explain the methods of aircraft construction and characteristics of aircraft materials. CO4: Analyze the characteristics of aircraft propulsion systems with their merits, demerits, and applications. CO5: Explain the principle of Flight Mechanics. CO6: Demonstrate the working of Primary and secondary control surfaces of an aircraft.
----------------	---

Email I'd	marisbrightson@soaneemrana.org	Phone No.	805-667-7643
-----------	--------------------------------	-----------	--------------

Student Name		Student Reg No.	
--------------	--	-----------------	--

**Part A****INSTRUCTIONS FOR 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.**

1

**Question : 1** Write the specifications of the Wright Flyer.

Lesson Plan No. - 1	Topic - Aviation History	Source - Introduction to Flight - J D Anderson	CO No. -
---------------------	--------------------------	--	----------

**Question : 2** Write any three differences between PSLV and GSLV.

Lesson Plan No. - 3	Topic - Aviation History	Source - Introduction to Flight - J D Anderson	CO No. -
---------------------	--------------------------	--	----------

<b>Question : 3</b>			
Lesson Plan No. -	Topic -	Source -	CO No. -

<b>Question : 4</b>			
Lesson Plan No. -	Topic -	Source -	CO No. -

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

2

**Question : 5**

Lesson Plan No. -	Topic -	Source -	CO No. -
-------------------	---------	----------	----------

**Question : 6** Define Angle of Attack? What is a Critical Angle of Attack?

Lesson Plan No. - 4	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. -
---------------------	----------------------	--	----------

**Question : 7** Define Aspect Ratio? What will be the Aspect Ratio for the wing having rectangular planform?

Lesson Plan No. - 6	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. -
---------------------	----------------------	--	----------

<b>Question : 8</b>			
Lesson Plan No. -	Topic -	Source -	CO No. -

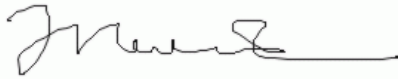
<b>Question : 9</b>			
Lesson Plan No. -	Topic -	Source -	CO No. -

<b>Question : 10</b>			
Lesson Plan No. -	Topic -	Source -	CO No. -

**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 has to 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 has to 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>			1
<b>Question : 1</b>	Explain the Classification of Flight Vehicles.		
Lesson Plan No. - 2	Topic - Aviation History	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Question : 2</b>	Explain the principles of flight for Aircraft.		
Lesson Plan No. - 4	Topic - Aviation History	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Question : 3</b>	Discuss the Mars Orbiter Mission of ISRO.		
Lesson Plan No. - 3	Topic - Aviation History	Source - Introduction to Flight - J D Anderson	CO No. -
<b>4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			2
<b>Question : 4</b>	With a neat illustrative diagram explain the geometry of the Positive Cambered Airfoil section. Define the terminologies used in that Airfoil geometry.		
Lesson Plan No. - 5	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Question : 5</b>	Explain the following NACA Airfoil Series. What will be their geometry if the chord length is 10 m. (1) NACA 0018 (2) NACA 2416 (3) NACA 24115 (4) NACA 612-318		
Lesson Plan No. - 7	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Question : 6</b>	Write short notes on (1) Critical Mach Number (2) Drag Divergence Mach Number		
Lesson Plan No. - 10	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Part C</b>			
<b>FOR MIDTERM 1 - Part C: Total number of questions to be given are four (2 from CO1 and 2 from CO2), out of which student has to answer two (1 from CO1 and 1 from CO2).</b> <b>FOR MIDTERM 2 - Part C: Total number of questions to be given are four (2 from CO3 and 2 from CO4), out of which student has to answer any two (1 from CO3 and 1 from CO4).</b> <b>FOR MIDTERM 3 - Part C: Total number of questions to be given are four (2 from CO5 and 2 from CO6), out of which student has to answer any two (1 from CO5 and 1 from CO6).</b>			
<b>5. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			1
<b>Question : 1</b>	Derive the equation for Speed of Sound traveling in the gas medium. From the obtained equation, calculate the speed of sound for the standard sea-level conditions.		
Lesson Plan No. - 11	Topic - Speed of Sound	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Question : 2</b>	Derive the expression for the relationship between Lift Coefficient and Pressure Coefficient.		
Lesson Plan No. - 12	Topic - Prssure Coefficient	Source - Introduction to Flight - J D Anderson	CO No. -
<b>6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.</b>			2
<b>Question : 3</b>	An aircraft is cruising at an altitude of 10 km with a speed of 645 km/hr. The weight of the aircraft is 725 KN. The Aspect Ratio, Span Efficiency factor & Profile drag coefficient of the wing are 9.5, 0.9 & 0.01 respectively. Aircraft wing area is 122.4 m2. Calculate (1) Induced Drag Coefficient (2) Drag force acting on the aircraft		

Lesson Plan No. - 12	Topic - Numericals	Source - Introduction to Flight - J D Anderson	CO No. -
<b>Question : 4</b>	(1) The pressure at a point of the wing of an airplane is 75800 N/m <sup>2</sup> . The airplane is flying with a velocity of 70 m/s at an altitude of 2 km. Calculate the local velocity at this point. (2) Consider the low-speed airplane flying at a velocity of 55 m/s. If the velocity at a point on the fuselage is 62 m/s, What is the pressure coefficient at this point?		
Lesson Plan No. - 12	Topic - Numericals	Source - Introduction to Flight - J D Anderson	CO No. -
<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>			
I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.			
<b>Corporate Office: H 974, Palam Extension, Part 1, Sector 7, Dwarka, New Delhi 110077</b>			

The message has been sent from 123.63.6.45 (India) at 2021-01-09 17:35:53 on Firefox 85.0  
Entry ID: 71