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 / 78

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 2	Date of Submission	27/01/2021
Name of Faculty	Mr. Maris Brightson	Date of Examination	05/02/2021
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	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.		
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.			3
Question : 1	Define Truss. List the types of Truss used for construction.		
Lesson Plan No. - 12	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 2	List the differences between Monocoque construction and Semi-Monocoque construction.		
Lesson Plan No. - 12	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 3	Describe the functions of Landing Gear.		
Lesson Plan No. - 14	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 4	Define composite materials. List some of the applications of composite materials.		
Lesson Plan No. - 13	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 5	Define Strength to Weight Ratio.		
Lesson Plan No. - 12	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -
2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			4
Question : 6	Define TSFC. Write its formula and SI unit.		
Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 7	Define Specific Impulse. Write its formula and SI unit.		
Lesson Plan No. - 20	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 8	List the different types of engines used in aircraft.		
Lesson Plan No. - 15	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 9	Define Isentropic Process. Write the isentropic relations.		
Lesson Plan No. - 16	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -
Question : 10	Describe what will happen if you add petrol to a diesel engine.		
Lesson Plan No. - 18	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	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)			
3. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			3
Question : 1	Explain the types of metallic and non-metallic materials used in airplanes.		

Lesson Plan No. - 13	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -

Question : 2	Explain the airplane fuselage construction with neat illustrative diagrams.		

Lesson Plan No. - 13	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -

Question : 3	Explain the airplane wing construction with neat illustrative diagrams.		

Lesson Plan No. - 14	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. -

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

Question : 4	Describe the working of Gas Turbine Engines with a neat illustrative diagram.		

Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

Question : 5	Illustrate PV and TS diagram for a Gas Turbine Engine. Explain each process.		

Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

Question : 6	Compare the merits and demerits of Gas Turbine Engines and Reciprocating Engines.		

Lesson Plan No. - 20	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

Part C

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).
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).
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).

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

Question : 1	Describe the working of 4 stroke Petrol Engine (SI) and 4 stroke Diesel Engine (CI) with neat illustrative diagrams.		

Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

Question : 2	Derive the general equation of thrust for jet-propelled engines. Deduce the thrust equation for turbojet engines and rocket engines.		

Lesson Plan No. - 16	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

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

Question : 3	A Rocket engine has the following performance details: Oxidizer flow rate 4 kg/s, Fuel flow rate 1 kg/s, Exit Velocity 5400 km/hr, Nozzle Exit Diameter 10 cm, Nozzle Exit pressure 1.02 bar, Ambient Pressure 1.013 bar. Calculate (1) The thrust of the Rocket Engine (2) Specific Impulse (3) Effective Exhaust Velocity		

Lesson Plan No. - 20	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

Question : 4	Consider a Turbojet airplane flying at a velocity of 900 Kmph with an altitude of 10 km. The inlet and exit areas of the engine are 0.5 m2 and 0.3 m2 respectively. The velocity and pressure of exhaust gases at the exit are 500 m/s and 0.305 bar respectively. Calculate the thrust of the Turbojet engine. If the fuel flow rate is 0.5 kg/s calculate its TSFC?		

Lesson Plan No. - 25	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. -

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 110077

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