

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 / 22

Instructions For Students / Faculty Mid Term I (Total 40 Marks, 1.5 HRS. Syllabus From Beginning Of Session)

- Part A: Total number of questions to be given are four, 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 five, out of which student has to answer any three. They are long answer type (**Not More Than 50 Words For Question Only**), each carrying 6 marks. Total 18 marks.
- Part C: Total number of questions to be given are three, out of which student has to answer any two. They are numerical answer type / fully elaborative type* (**Not More Than 70 Words For Question Only**), each carrying 7 marks. Total 14 marks.

Mid Term II & III (Total 60 Marks, 2 HRS. Syllabus From Beginning Of Session)

- Part A: Total number of questions to be given are ten, 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, out of which student has to answer any four. They are long answer type (**Not More Than 50 Words For Question Only**), each carrying 5 marks. Total 20 marks.
- Part C: Total number of questions to be given are three, out of which student has to answer any two. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question Only**)*, each carrying 10 marks. Total 20 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).

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

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 2	Date of Submission	19/08/2020
Name of Faculty	Mr. Maris Brightson	Date of Examination	26/08/2020
Course	B.Tech (Aeronautical Engineering)	Semester	SEMESTER : 3
Batch	Combined Batches 18, 19, SF 2	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	COURSE OUTCOME Upon completion of the course, Students will be able to CO1: Describe the classification and working principles of different types of flight vehicles and its components. CO2: Illustrate the basic principles of aerodynamics, characteristics of airfoils and NACA numbering system for airfoil. CO3: Explain the methods of aircraft construction and characteristics of aircraft materials. CO4: Analyze the characteristics of aircraft propulsion systems with its merits, demerits and applications. CO5: Explain 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			
Question : 1	Write the specifications of PSLV and GSLV.		
Lesson Plan No. - 2	Topic - History of Flight Vehicles	Source - Introduction to Flight - J D Anderson	CO No. - 1
Question : 2	Explain NACA 2412.		
Lesson Plan No. - 5	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. - 2
Question : 3	Define Aerodynamic Center? How Aerodynamic Center is useful in Airplanes?		
Lesson Plan No. - 4	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. - 2
Question : 4	Define Taper Ratio? What will be the taper ratio of rectangular planform wing?		

Lesson Plan No. - 6	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. - 2
Question : 5	Define Truss? What are the types of Truss?		
Lesson Plan No. - 12	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. - 3
Question : 6	Define Composite Materials? Name few composite materials used in Aircrafts.		
Lesson Plan No. - 13	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. - 3
Question : 7	What are important functions of Landing Gear?		
Lesson Plan No. - 14	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. - 3
Question : 8	Define Air-Fuel Ratio? What are the types of mixture we get depending on Air-Fuel Ratio?		
Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Question : 9	What will happen if we use Petrol in Diesel Engine? Explain.		
Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Question : 10	What are the different types of engines used in Aircrafts?		
Lesson Plan No. - 18	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Part B			
Question : 1	Explain the principles of flight for Aircraft.		
Lesson Plan No. - 4	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. - 2
Question : 2	With neat illustrative diagrams explain the different Wing Planforms of an Airplane.		
Lesson Plan No. - 6	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. - 2
Question : 3	If a aircraft is flying 6 km above the ground at the speed of 250 km/hr. What will be the Mach Number of that Aircraft?		
Lesson Plan No. - 11	Topic - Aerodynamics	Source - Introduction to Flight - J D Anderson	CO No. - 2
Question : 4	Explain the various metallic and non-metallic materials used in Aircrafts.		
Lesson Plan No. - 13	Topic - Structures	Source - Introduction to Flight - J D Anderson	CO No. - 3
Question : 5	Draw and explain PV and TS diagrams for an Ideal Brayton Cycle.		
Lesson Plan No. - 15	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Question : 6	Explain the working of 4 Stroke Diesel Engine with neat illustrative diagrams.		
Lesson Plan No. - 17	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Part C			
Question : 1	Derive the general Thrust equation for Jet Propulsion. What will be the thrust equation for (a) Turbojet Engines (b) Rocket Engines?		
Lesson Plan No. - 16	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Question : 2	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) Specific Impulse (2) The thrust of the Rocket Engine		
Lesson Plan No. - 20	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Question : 3	Consider a Turbojet airplane flying at a velocity of 900 Kmph with the altitude of 10 km. The inlet and exit areas of engine are 0.5 m ² and 0.3 m ² 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 what will be its TSFC?		

Lesson Plan No. - 20	Topic - Propulsion	Source - Introduction to Flight - J D Anderson	CO No. - 4
Upload Scanned Document In Case of Numerical or Diagram For Any of The Above Questions. <i>(Mention question number with relevant fig / numerical / equations. Max 150 KB)</i>			
I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.			

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