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 3 / 55 / SET 1

Instructions For Students / FacultyMid Term I (Total 60 Marks, 2 HRS. Syllabus From Beginning Of Session)
• Part A: Total number of questions to be given are five, 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 15 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)**, each carrying 6 marks. Total 24 marks.
• Part C: Total number of questions to be given are four, out of which student has to answer any three. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question)***, each carrying 7 marks. Total 21 marks.
Mid Term II & III (Total 90 Marks, 2.5 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 seven, out of which student has to answer any five. They are long answer type (**Not More Than 50 Words For Question)**, each carrying 6 marks. Total 30 marks.
• Part C: Total number of questions to be given are five, out of which student has to answer any four. They are numerical answer type / fully elaborative type (**Not More Than 70 Words For Question)***, each carrying 10 marks. Total 40 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 (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)

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

Question Paper & Student Details

Mid Term	Mid Term 3	**Date of Submission**	25/09/2020
Name of Faculty	Mr. Sidhartha Sondh	**Date of Examination**	30/09/2020
Course	B.Tech (Aeronautical Engineering)	**Semester**	SEMESTER : 3
Batch	Combined Batches 18, 19, SF 2	**Subject**	3 AN3 - 03 Engineering Thermodynamics (Cr 3)

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: Apply different laws and basics of thermodynamic process. CO2: Analyze cyclic & Non-cyclic processes using Zeroth and First law of thermodynamics. CO3: Relate theoretical knowledge with various flow processes like steady flow, unsteady flow. CO4: Interpret the second law of thermodynamics for various engineering systems. CO5: Explain the concept of entropy and the types of energy for closed and open systems. CO6: Classify Types of basic air standard cycles, the working principles and their application in engineering problems.

Email I'd	sidharthasondh@soaneemrana.org	**Phone No.**	963-455-7511
Student Name		**Student Reg No.**	

Part A			
Question : 1	What is Classius inequality?		
15	Entropy	Self	4
Question : 2	Represent a steady state function mathematically.		

2	Fundamentals	Self	1
Question : 3	What is the significance of Gibbs energy?		
17	Availability	Self	5
Question : 4	How does Rankine cycle improve Carnot cycle?		
19	Thermodynamic cycles	Self	6
Question : 5	Differentiate between Kelvin and Celsius.		
3	Fundamentals	Self	1
Question : 6	What is the significance of thermodynamic laws in engineering?		
4	Fundamentals	Self	1
Question : 7	What is control volume system?		
6	Fundamentals	Self	2
Question : 8	Define COP.		
14	2nd Law	Self	4
Question : 9	Differentiate between work and heat.		
6	Fundamentals	Self	2
Question : 10	What is the application of throttling process in engineering?		
8	Application of 1st law	Self	3
Part B			
Question : 1	Write short notes on: i. Carnott cycle ii. Rankine cycle iii. Brayton cycle		
22	Thermodynamic cycles	Self	6
Question : 2	Derive the relations for entropy change of an ideal gas in terms of Temperature and Pressure.		
17	Entropy	Self	5
Question : 3	Differentiate between (i) P-v diagram and T-s diagram (ii) Reversible and Irreversible process		
5	Fundamentals	Self	1
Question : 4	Why availability is defined on the basis of wok and not on heat? What is quality of energy? Describe with a suitable example.		
18	Availability	Self	5
Question : 5	A reversible heat pump is used for heating a building in the winter season. The heat is absorbed from the earth by a fluid circulating in buried pipes and delivered to the building to maintain the temperature at 23 ^{o}C. Determine amount of heat supplied to building if one kW-hr of electrical energy is needed to operate the heat pump. The soil temperature maybe taken as 0 ^{o}C.		
14	2nd Law	Engineering Thermodynamics By Domkundwar	4
Question : 6	Give the following statements of the second law of thermodynamics (a) Kelvin-Planck statement and (b) Classius statement. Is the second law independent of first law? Take a suitable example to justify.		
16	2nd Law	Self	4
Question : 7	State the role of laws of thermodynamics i.e; First law, Second law, Zeroth law in designing an energy conversion system.		
4	Application of laws	Self	1
Part C			

Question : 1	Comment on the statement “The entropy of universe tends to be maximum”. What do you understand by thermal death of universe?		
15	Entropy	Self	5
Question : 2	400 kJ of heat from a large source at 1000 K is supplied to 2 kg of gas initially at 2 bar and 350 K in a closed tank. Cv = 0.86 kJ/kg- K for the gas. Find the loss in available energy of the system. Take surrounding temperature as 300 K.		
18	Availability	Engineering Thermodynamics By Domkundwar	5
Question : 3	An inventor makes the following claims. Determine, whether his claims are valid or invalid? Why? An engine operates between 1000K and 400K with a heat transfer into the engine of 500 kW. The inventor states that the heat transfer to the low temperature reservoir is 250 kW and the work output is 250 kW.		
13	2nd law	Engineering Thermodynamics By Domkundwar	4
Question : 4	In a steam power plant operating on an ideal Rankine cycle, the steam enters the turbine at 3 MPa and 400deg C and it is exhausted at 10 kPa. Determine i. Thermal efficiency ii. Thermal efficiency, if steam is super heated to 500 deg C at 3 MPa before it enters turbine.		
22	Thermodynamic cycles	Previous year RTU questions	6
Question : 5	The conditions of steam at inlet and outlet of the triple expansion engine which develops 750 kW power are listed as given below p1 = 10 bar, T1= 200°C, vs1 = 0.206 m3/kg, h1 = 2827 kJ/kg, V1=20 m/sec and p2=0.15 bar, T2=54°C, vs2=8.93 m3/kg, h2=2340.5 kJ/kg, V2 = 120 m/sec. The flow of steam through the turbine is 2.1 kg/sec. Determine heat transfer per second from engine.		
9	Application of 1st law	Engineering Thermodynamics By Domkundwar	3
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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