

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 / 134

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	22/07/2021
Name of Faculty	Mr. Yatan	Date of Examination	27/07/2021
Course	B.Tech (Aeronautical Engineering)	Semester	SEMESTER : 4
Batch	Combined Batches 18, 19, SF 2	Subject	4 AN3 - 03 Heat Transfer (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: Relate theoretical knowledge with various convection and Natural convection process in heat transfer. CO4: Interpret the Heat Transfer with change of Phase and its application in field of aeronautical engineering.		
Email I'd	yatannagpal@soaneemrana.org	Phone No.	798-226-2196
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.**

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Question : 1 Give the types of methods to solve steady state conduction equation.

Lesson Plan No. - 9	Topic - Steady state conduction equation	Source - R.K. Rajput	CO No. -
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Question : 2 State the importance of numerical method.

Lesson Plan No. - 10	Topic - Numerical method	Source - R.K. Rajput	CO No. -
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Question : 3 State the Navier-Stoke's equation and also write only the expression of Navier-Stoke's equation.

Lesson Plan No. - 11	Topic - Navier-Stoke's equation	Source - R.K. Rajput	CO No. -
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Question : 4 State some applications of fins.

Lesson Plan No. - 8	Topic - Finned Surfaces	Source - R.K. Rajput	CO No. -
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Question : 5 Define periodic state conduction equation

Lesson Plan No. - 10	Topic - Periodic state conduction equation	Source - R.K. Rajput	CO No. -
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2. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.

4

Question : 6 State the meaning of boundary layer.

Lesson Plan No. - 17	Topic - Boundary layer	Source - R.K. Rajput	CO No. -
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Question : 7 Define natural or free convection.

Lesson Plan No. - 15,16	Topic - Natural convection	Source - R.K. Rajput	CO No. -
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Question : 8 Define forced convection.

Lesson Plan No. - 13	Topic - Forced convection	Source - R.K. Rajput	CO No. -
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Question : 9 Define turbulent flow through pipes.

Lesson Plan No. - 14	Topic - Turbulent flow through pipes	Source - R.K. Rajput	CO No. -
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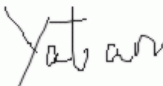
Question : 10 State the meaning of laminar and turbulent flow.

Lesson Plan No. - 14	Topic - Laminar and turbulent flow	Source - R.K. Rajput	CO No. -
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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	Derive an expression of 2-D steady state heat conduction equation using analytical method.		
Lesson Plan No. - 9	Topic - Analytical/Numerical method	Source - R.K. Rajput	CO No. -
Question : 2	Deduce and explain the relationship between fin efficiency and fin effectiveness.		
Lesson Plan No. - 8	Topic - Fin efficiency and fin effectiveness	Source - R.K. Rajput	CO No. -
Question : 3	Derive the equation of heat dissipated from an infinitely long rectangular fin.		
Lesson Plan No. - 8	Topic - Fin efficiency and fin effectiveness	Source - R.K. Rajput	CO No. -
4. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			4
Question : 4	Explain the methods of dimensional analysis with examples.		
Lesson Plan No. - 15	Topic - Dimensional analysis	Source - R.K. Rajput	CO No. -
Question : 5	Explain the relation of Prandtl number and Nusselt number in case of empirical correlation of forced convection.		
Lesson Plan No. - 14	Topic - Empirical relations for flow over a flat plate	Source - R.K. Rajput	CO No. -
Question : 6	Explain briefly, the advantages and disadvantages of dimensional analysis.		
Lesson Plan No. - 13	Topic - Forced convection appropriate non dimensional members	Source - R.K. Rajput	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	Derive the momentum equation for hydrodynamic equation for hydrodynamic boundary layer over a flat plate.		
Lesson Plan No. - 12	Topic - Hydrodynamic boundary layer	Source - R.K. Rajput	CO No. -
Question : 2	Derive the energy equation for thermal boundary layer.		
Lesson Plan No. - 12	Topic - Thermal boundary layer	Source - R.K. Rajput	CO No. -
6. CHOOSE COURSE OUTCOME (CO) NUMBER ACCORDING TO THE TYPE OF MIDTERM, AS PER INSTRUCTIONS ABOVE.			4
Question : 3	The efficiency of a fan depends on the density ρ , the dynamic viscosity μ of the fluid, the angular velocity, diameter D of the rotor and the discharge Q . Express efficiency in terms of dimensionless parameters.		
Lesson Plan No. - 15	Topic - Natural Convection: Dimensional analysis, Grashoff number	Source - R.K. Rajput	CO No. -
Question : 4	Elaborate briefly, the concept of boundary layer with the help of a diagram.		

Lesson Plan No. - 16	Topic - Boundary layer	Source - R.K. Rajput	CO No. -
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.			
Corporate Office: H 974, Palam Extension, Part 1, Sector 7, Dwarka, New Delhi 110077			

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