Reg.No:

SNS College of Technology, Coimbatore-35.
(Autonomous)
B.E / B.Tech- Internal Assessment -III
Academic Year 2023-2024 (Odd Semester)
Fifth Semester
Aerospace Engineering
19ASE304– Heat Transfer

A

Time: 1 ½ Hours **Maximum Marks: 50**

Answer All Questions

PART - A (5x 2 = 10 Marks)

				CO	Blooms
1.		What is meant by thermal diffusivity?		CO4	Und
2.		Define vorticity method in heat transfer.		CO4	Ana
3.		Which numerical method is fastest? Why?		CO4	Ana
4.		What are properties of heat?		CO5	Und
5.		What are 5 examples of heat?		CO5	Und
PART B (13+13+14 =40 marks)					
				CO	**Blooms**
6.	(a)	Derive the heat conduction equation using a numerical approach for a stationary isotropic solid.	13	CO4	App
		(or)			
	(b)	Differentiate between Finite element method and volumetric method.	13	CO4	Ana
7.	(a)	An aluminum rod (k=200 W/mK) of 20mm diameter and 0.2m long protrudes from a wall which is maintained at 400^0C.The end of the rod is insulated and the surface of the rod is exposed to air at 30^0.The air flowing around the rod gives a convection coefficient 40W/m^2K.with a help of numerical method. (a) Calculate the temperature of the six nodes.(b) Determine the rate of heat loss from the base through the fin.(c) Compare the results with those obtained analytically.	13	CO5	Eva
		(or)			
	(b)	Illustrate the heat transfer problems encountered in gas turbines.	13	CO5	Und
8.	(a)	List out the numerical methods applicable to radiation heat transfer.	14	CO4	Cre
		(or)			
	(b)	Briefly explain the working principle of reentry Aerodynamic heating.	14	CO5	Und

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Abbreviations: Rem- Remember: Und- Understand : App-Apply: Ana-Analyze: Eva-Evaluate: Cre-Create

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19ASE304– Heat Transfer

B

Time: 1 ½ Hours **Maximum Marks: 50**

Answer All Questions

PART - A (5x 2 = 10 Marks)

				CO	Blooms
1.		Which are the numerical methods?		CO4	Und
2.		How many methods are there in numerical method?		CO4	Ana
3.		Where we use numerical methods in real life?		CO4	Ana
4.		What are the applications of heat transfer?		CO5	Und
5.		How does NASA deal with heat transfer problems on the space shuttle?		CO5	Und
PART B (13+13+14 =40 marks)					
				CO	**Blooms**
6.	(a)	Derive 2D heat conduction equation in numerical approach.	13	CO4	App
		(or)			
	(b)	Explain about the steps involved to solve heat transfer problems in numerical method.	13	CO4	Ana
7.	(a)	Write notes on aerodynamic heating.	13	CO5	Und
		(or)			
	(b)	Explain the concept of thermal analysis of multi-layer insulation	13	CO5	App
8.	(a)	Derive an equation for extended surface analysis using FDM.	14	CO4	Cre
		(or)			
	(b)	How heat transfer plays a vital role in gas turbines.	14	CO5	Cre

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Abbreviations: Rem- Remember: Und- Understand : App-Apply: Ana-Analyze: Eva-Evaluate: Cre-Create