



GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY

(Unit of USHODAYA EDUCATIONAL SOCIETY, Nellore)

(Approved by AICTE, New Delhi & Permanently Affiliated to JNTUA, Anantapur)

An ISO 9001 : 2015 Certified Institution - Recognised U/s. 2(f) & 12(B) of UGC Act 1956

3rd Mile, Nellore - Bombay Highway, Gangavaram (V), Kavur (M), S.P.S.R. Nellore Dt, Andhra Pradesh - India. 524 137

JNTUA College Code : 2U

Phone : 08622 – 212879 / e-mail : geethanjali@gist.edu.in / website : www.gist.edu.in

II B.TECH II SEM MID-II EXAMINATIONS

DESCRIPTIVE QUESTION PAPER

Name of the subject	THERMODYNAMICS	Duration	90 MINUTES
Date of Exam	10.08.2021 AN	BRANCH	ME
HT NO.		Sign of Invigilator	

ANSWER ALL QUESTIONS BY CHOOSING ATLEAST ONE QUESTION FROM EACH PART

15 M

S.No	UNIT	Blooms Taxonomy	CO	QUESTION DESCRIPTION	MARKS
------	------	-----------------	----	----------------------	-------

PART-I

1	II	Understand	CO3	Establish the equivalence of Kelvin- Planck and Clausius statements	5
---	----	------------	-----	---	---

OR

2	II	Understand	CO3	(a) What is thermal energy reservoir? Explain the Kelvin Planck statement of the second law.	2.5
				(b) Show that the COP of a heat pump is greater than the COP refrigerator by unity.	2.5

PART-II

3	III	Apply	CO4	(a) show that the efficiency of a reversible engine operating between two given constant temperatures is the maximum	2.5
				(b) A domestic food freezer maintains a temperature of -150 C. The ambient air temperature is 300 C. If heat leaks into the freezer at the continuous rate of 1.75 kJ/s, what is the least power necessary to pump this heat out continuously?	2.5

OR

4	III	Understand	CO4	(a) Show that entropy is a property of a system	2.5
				(b) Explain the working of Carnot cycle with the help of P-V and T-S diagrams	2.5

PART-III

5	IV	Understand	CO5	What is steam quality? Explain the method of measuring steam quality using throttling calorimeter.	5
---	----	------------	-----	--	---

OR

6	IV	Apply	CO4	(a) Derive Maxwell's equations	3
				(b) Derive Dalton's law of partial pressures for mixture of gases.	2