

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: MTech.
BRANCH: Remote Sensing**

**SEMESTER : II
SESSION : SP/2025**

SUBJECT: RS523 PHYSICAL METEOROLOGY

TIME: 3 Hours

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	How temperature and pressure vary in the atmosphere vertically? How does temperature control the vertical rate of pressure change in the atmosphere?	[5] CO1	3
Q.1(b)	What is Lapse Rate? Why does the moist adiabatic lapse rate and dry adiabatic lapse rate differ? Explain in details.	[5] CO2	2
Q.2(a)	Derive Poisson's equation and describe its significance.	[5] CO2	3
Q.2(b)	Carnot cycle deals with certain atmospheric processes. Explain those processes with the help of P-V diagram with special emphasis on slope of the curve.	[5] CO2	3
Q.3(a)	Describe the following laws related to blackbody radiation: a) Wien's Displacement Law b) Stefan-Boltzmann Law	[5] CO4	2
Q.3(b)	Explain the heat/energy budget with a diagram. Given an increase in solar radiation due to a reduction in atmospheric aerosols, explain how the Heat Budget might be impacted.	[5] CO4	3
Q.4(a)	Define CCN and explain the key differences between homogeneous and heterogeneous nuclei in terms of their ability to serve as cloud condensation nuclei (CCN).	[5] CO3	2
Q.4(b)	What are the major climate types identified in India according to the Köppen climate classification? Describe in brief.	[5] CO4	4
Q.5(a)	Describe the Inter-Tropical Convergence Zone (ITCZ) in brief. How does it influence the Indian region?	[5] CO5	2
Q.5(b)	Explain the characteristics and impacts of Indian Ocean Dipole (IOD) in context of Indian Monsoon.	[5] CO5	3

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