Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

I SEMESTER M.TECH. (ENVIRONMENTAL ENGINEERING)

END SEMESTER EXAMINATION, FEBRUARY 2021

SUBJECT: AIR & NOISE ENVIRONMENT

[CIE-5182]

DATE: 26 – 02 – 2021 **TIME OF EXAM: 2 – 5PM** **MAX. MARKS: 50**

Instructions to Candidates:

- Answer **ALL** questions.
- Missing data may be assumed suitably.
- Stability table is allowed (Single sheet)

1A.	Define the following: i) Dry adiabatic lapse rate. ii) Conditional stability. iii) Subsidence inversion. iv) Aerosols.	**04**	**CO2**
1B.	Explain the various methods of identification of air pollution. Discuss with examples the stationary and mobile sources of air pollutants.	**06**	**CO1**
2A.	Write the Gaussian dispersion equation. Explain with neat sketches the different types of plume behavior under non-uniform lapse rate.	**04**	**CO2**
2B.	Discuss the characteristics and various chemical reactions involved in the formation of a photochemical smog.	**06**	**CO1**
3A.	Explain sampling of SO_2 from the ambient air and its laboratory analysis.	**05**	**CO3**
3B.	A 550 MW coal powered power plant is built to disperse the flue gases using a tall stack. The design stack height is 80m. The stack radius is 2m. The stack exit velocity is estimated to be 15m/sec. The design exit temperature is 293°F. Calculate the effective stack height for an ambient air temperature of 59°F on a sunny day with moderate wind speed of 7m/s at the stack altitude.	**05**	**CO2**
4A.	Explain in detail with neat sketches the different conditions involved in stack sampling of particulate matter pollutants.	**05**	**CO3**
4B.	A power plant is emitting NO_2 @ 800g/s through a stack of 300m high. If the plume rises to a height of 100m, what is the ground level centerline concentration of NO_2 for this source at a distance of 1km downwind when the wind speed is 7m/s? Also calculate the same with only plume rise. The stability category is C.	**05**	**CO3**
5A.	Give any four objectives of air pollution index. Explain in detail with a neat sketch the construction and working of a cyclone separator.	**05**	**CO4**
5B.	Discuss the various types of noise with examples and different methods to control noise pollution.	**05**	**CO5**