

MANIPAL INSTITUTE OF TECHNOLOGY

V SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, DECEMBER 2017

SUBJECT: AIR POLLUTION AND CONTROL [CIE 4017]

REVISED CREDIT SYSTEM

(/11/2017)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

n of Manipal University

- Dispersion Coefficient charts and tables, AQI table are allowed
- Missing data may be suitable assumed.

QNo	Questions	Marks
1A.	Derive the expression for ground level concentration of pollutant using Gaussian plume model.	4
1B.	With chemical equation explain generation any two gaseous pollutant from its sources and their effects on human.	4
1C.	Distinguish between primary and secondary pollutant with examples.	2
2A.	Determine the air quality index (AQI) determined for multiple pollutants, an 8-hour ozone value of 0.077 ppm, a PM2.5 value of $54.4\mu g/m^3$, and a CO value of 8.4 ppm	4
2B.	Explain looping and lofting plume behavior with a graph between altitude and temperature.	4
2C.	Discuss the effect of air pollutants on stone material.	2
3A.	Explain air quality sub index parameter. What all details should be shown in an AQI report?	4
3B.	Define cut diameter. A conventional cyclone with diameter 0.5 m handles 4.0 m ³ /s of standard air (μ =1.81×10 ⁻⁵ kg/m-s and density of gas being negligible w.r.t density of particles) carrying particles with a density of 2500 kg/m. For N=6, inlet width is 0.25 m, inlet height is 0.5 m, determine the cut size of particle diameter.	3
3C.	List the various guidelines laid out in National Air act, 1981.	3
4A.	The exhaust rate of the gas being processed is given as 28316 m ³ /min. The inlet dust concentration in the gas as it enters the ESP is 285 gm/ m ³ . If the emission regulations state that the outlet dust concentration must be less than 1.42 gm/ m ³ , how much collection area is required to meet the regulations? Assume the migration velocity is 0.09 m/sec.	3

	Reg. No.		
MANIPAL INSTITUTE OF TECHNOLOGY			
4B.	Describe the grate system and methods to remove air pollution control residue from an incineration plant	5	
4C.	List the nontechnical measures to control vehicular air pollution	2	
5A.	Explain the guidelines for location of a monitoring station for ambient air quality monitoring.	4	
5B.	With a neat flow chart explain modular incineration process.	3	
5C.	Distinguish between Chemiluminescence and Ultraviolet fluorescence methods of measurement of ambient air with neat sketch.	3	