Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
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V SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, NOVEMBER/DECEMBER 2017

SUBJECT: AIR POLLUTION AND CONTROL [CIE 4017]

REVISED CREDIT SYSTEM
(22/11/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Dispersion Coefficient charts and tables, AQI table are allowed
- Missing data may be suitably assumed.

QNo	Questions	Marks
1A.	Explain the generation of Ozone in the atmosphere with chemical equations and the influence of CFC molecules on the same.	**4**
1B.	Derive Dry Adiabatic Lapse rate (DALR) value for assessing atmospheric stability when air moves from sea level to a height of 1 Km.	**4**
1C.	With reason explain how inversion affects atmospheric stability?	**2**
2A.	Calculate AQI value for 8 hour ozone concentration of 0.087 ppm observed at Mangalore and represent in report format.	**3**
2B.	a) A factory emits 20 g/s of SO_2 at a height H (including plume rise). Wind speed is 3 m/s. Atmospheric condition is slightly stable in night with clouds all over. What is the SO_2 Concentration at centerline of the plume? b) Explain plume rise height. How it is related to effective stack height?	**5**
2C.	Explain “Cap and Trade” and Carbon tax.	**2**
3A.	Explain any two methods of measurement of gaseous pollutant with neat sketch.	**3**
3B.	Describe high volume sampler with a neat sketch	**3**
3C.	Estimate the cut diameter and overall collection efficiency of a cyclone separator given the particle size distribution of dust from cement kiln. Particle size distribution and other data are given below. Density of gas is neglected. Calculate collection efficiency by forming a tabular column.	**4**

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	Gas viscosity = 2.5×10^{-5} Kg/m-s; Specific Gravity of the particle = 2500 Kg/m^3 ; Inlet gas velocity of cyclone = 12 m/sec; Effective number of turns within cyclone = 5 Cyclone diameter = 2 m, Cyclone inlet width = 0.7 m	
4A.	Explain the various technical measures to control vehicular air pollution	**5**
4B.	Describe any three effect of air pollutants on plant leaf with their source.	**3**
4C.	How Positive crankcase ventilation system prevents air pollution?	**2**
5A.	Explain RDF method of incineration.	**2**
5B.	With chemical equation explain action of catalytic converters in vehicular pollution control.	**3**
5C.	How does resistivity of particle influence the efficiency of electrostatic precipitator? Also explain the principle, construction and working of ESP.	**5**

Avg Particle Size, dp, µm	1	5	10	20	30	40	50	60	>60
Weight Percent	3	20	15	20	16	10	6	3	7