Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.TECH. (CHEMICAL ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: PROGRAM ELECTIVE II – POLLUTION CONTROL ENGINEERING [CHE 4007]

REVISED CREDIT SYSTEM
(27/04/2017)

Time: 3 Hours MAX. MARKS: 100

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitable assumed.

1A.	With neat sketch, explain the dynamics of Nitrogen cycle. Explain the reasons for the impact and effects on this cycle.	**8**
1B.	"Prevention is better than cure". Elaborate in detail on this to justify the statement with respect to pollution control in process industries.	**8**
1C.	Differentiate between epidemiological and toxicological studies of air pollution.	**4**
2A.	Explain the estimation of trace heavy metals in industrial effluents.	**8**
2B.	Explain the chemiluminicent technique for NO - NO_2 measurement.	**8**
2C.	Compare and contrast between activated sludge process and trickling filters.	**4**
3A.	Explain with neat sketches, the sequential operations of sludge treatment and disposal.	**8**
3B.	Explain with neat flow sheets, the dissolved air flotation systems with and without recycle.	**8**
3C.	Explain the classification of types and sources of air pollutants.	**4**
4A.	Explain the characteristic properties of the effluents generated in a petroleum refinery. Explain the methods of control and abatement of pollution in this plant.	**10**
4B.	Explain the principle and working of a horizontal settling chamber. Derive the expressions for the collection efficiency of a Howard settling chamber assuming the laminar flow conditions.	**10**
5A.	Explain the following techniques for control of gaseous pollutants. i) Flaring ii) Catalytic combustion.	**10**
5B.	Explain any two processes with the flow diagrams along with the chemical reactions for emission control of SO_2.	**10**