Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

VII SEMESTER B.TECH (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: AUTOMOTIVE POLLUTION AND CONTROL [AAE471]

PROGRAMME ELECTIVE III

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE FULL** the questions.
- Missing data may be suitable assumed.

1A.	What are the sources of pollution in an automobile? Briefly discuss.	**(03)**
1B.	Explain constructional details and working modes of Gulp valve.	**(04)**
1C.	Discuss the effectiveness of positive crankcase ventilation system in minimizing the emissions with a neat sketch.	**(03)**
2A.	Write the reactions taking place in the catalytic converter. What are the methods of pre heating the catalysts?	**(03)**
2B.	What are crevice volumes in the engines? What is their effect on pollutants?	**(03)**
2C.	Explain the working principle of Van Brand smoke meter.	**(04)**
3A.	What is the effect of increasing the following variables on HC,CO and NOx formations? (i) Surface to Volume ratio (ii) Speed(iii) Spark retard (iv) Stroke to Bore ratio	**(03)**
3B.	Explain the essential features of Gas chromatography.	**(05)**
3C.	Why the air injection is necessary on the upstream side of catalytic converter when the engine is warming up?	**(02)**
4A.	What are the effects of the following variables on the performance of dual fuel engines? (i) Mixture strength (ii) Gaseous fuel used (iii) Pilot fuel quantity	**(03)**
4B.	Explain the working principle of Honda CVCC engine.	**(04)**
4C.	What are the various methods of Engine noise abatement? Briefly explain.	**(03)**
5A.	What are oxygenated fuels? Compare their performance with the gasoline on the basis of the following parameters. (i) Engine emissions (ii) volumetric efficiency (iii) compression ratio	**(03)**
5B.	Discuss the important requirements of fuels for usage in S I engines.	**(04)**

5C. Find the air- fuel ratio and equivalence ratio when Butane is combusted with 125% stoichiometric air in an Engine. Write the combustion equations. **(03)**

6A. Discuss the effect of burned gas fraction on the formation of oxides of Nitrogen. **(03)**

6B. State any four active methods of regeneration of particle traps. **(02)**

6C. Write short notes on (i) Thermal converters (ii) Diesel engine fuel requirements **(05)**