Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH (OPEN ELECTIVE)

MAKE UP EXAMINATIONS, JUNE 2018

SUBJECT: AUTOMOTIVE POLLUTION AND CONTROL (AAE 3284)

REVISED CREDIT SYSTEM
(25/06/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data **IF ANY**, may be suitably assumed and mentioned clearly

1A. Explain with neat sketch combustion requirements and three methods of charge stratification. **(05)**

1B. Why do you recommend bio diesel for automotive engine? Explain with neat block diagram catalytic transesterification method of bio diesel production. Write the advantages of this method of production. List out the different methods of bio diesel production. **(05)**

2A. List out the fuel requirements in SI engines. How the volatility influence the performance of the engine? What are the cause and effects of the following in the fuel **a)** Sulphur content **b)** gum deposit **c)** water content? **(05)**

2B. What is the need for instrumentation for pollution measurement? Explain with neat sketch the principle, functional aspects of flame ionization detector equipment. What are the limitations of this instrument? **(05)**

3A. Explain why fuel cells are an emerging technology? Differentiate fuel cell with solar cell. Explain with neat sketch working principle of Polymer electrolyte membrane (PEM) fuel cell and its important features **(04)**

3B. Discuss possible cause and effect of unburned hydrocarbons, carbon monoxide in IC Engines. **(03)**

3C. Explain the cause and effects of knocking in SI engine and how is it controlled? **(03)**

4A. What is particulate matter pollution? How the formation of particulate matter takes place? How the particulate matter pollution is categorized? **(05)**

4B. Explain the terms visible and invisible pollutants in CI engines. Identify three important pollutants during the emission from CI engines and discuss how the formation of pollutants takes place? **(05)**

5A. Explain with a neat block diagram and test driving cycle (ECE–15), roller dynamometer-constant volume emission sampling test. What is the need for the said test? **(05)**

5B. What is smoke in CI engines? How smoke is classified? How the formation of smoke takes place? Explain the following parameters which influence the formation of smoke: a) injection timing b) Injection nozzle c) load d) engine speed **(05)**