Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

IV SEMESTER B.TECH (OPEN ELECTIVE - I)

END SEMESTER EXAMINATIONS, JUNE/JULY 2016

SUBJECT: INTERNAL COMBUSTION ENGINES [MME 3284]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. With a neat sketch explain the working of a dual cycle **(05)**

1B. Give Reason:
i) Dissociation leads to lower brake power developed
ii) Variation in specific heat leads to lower work output. **(02)**

1C. Methane is burnt with atmospheric air and following products of combustion were measured using an ORSAT apparatus;CO_2= 10%, O_2= 2.37%, CO= 0.53% N_2= 87.10%. Calculate the A/F ratio and percentage of theoretical air and determine combustion equation. **(03)**

2A. A certain kind of engine has its working cycle based on constant pressure heat addition. Explain the stages in its combustion and also the factors affecting its first stage of combustion with neat sketches. **(05)**

2B. Give reason:
i) Increasing the inlet air density in SI engines raises the knocking effect and vice versa in CI engines.
ii) Lower flame velocities in the combustion chamber can be caused due to improper air fuel mixture ratios. **(05)**

3A. With neat sketches explain:
i) Compression swirl
ii) Induction swirl **(05)**

3B. With neat sketches explain any two types of combustion chamber designs used in swirl CI engines. **(05)**

4A. Briefly describe the factors to be considered for supercharging of an IC engine. **(05)**

4B. Compare supercharging and turbocharging. **(05)**

5A. What are the important variables to be controlled in an SI engine by an ECU? Draw a neat sketch of the BOSCH common rail diesel injection system engine management system and label all the parts. **(05)**

5B. For the following explain the working and its function in an IC engine management system:

i) Proximity sensor
ii) Strain gauge sensor
iii) Potentiometer
iv) Hall Effect pickup
v) Thermistor

Draw sketches wherever necessary. **(05)**