Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

III SEMESTER B.TECH (AERONAUTICAL & AUTOMOBILE ENGINEERING)
END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: THEORY OF AUTOMOTIVE ENGINES [AAE 2151]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Briefly explain about Opposed cylinder engine and Opposed piston engine. **(02)**

1B. Sketch the valve timing diagram of 2 stroke diesel engine and explain briefly. **(04)**

1C. A four-stroke petrol engine delivers 35 kW with a mechanical efficiency of 80%. The fuel consumption of engine is 0.4 kg per kW-hr and the air-fuel ratio is 14:1. The heat value of the fuel is 43000 kJ/kg. Find a).The Indicated power: b).The frictional power, c).Brake thermal efficiency, d).Fuel consumption per hour. **(04)**

2A. What are the modifications to be done for an engine for supercharging? **(02)**

2B. List the different shapes of piston compression ring and explain any one type. **(04)**

2C. What is meant by Manifolds? Mention the types of inlet and exhaust manifolds used in practice and also write their advantages and disadvantages. **(04)**

3A. Explain the working principle of Solex carburetor during starting the engine. **(02)**

3B. Write the different types of fuel supply systems used in Petrol engine and Briefly explain each type. **(04)**

3C. A 10 cm × 12 cm four cylinder, 4-stroke engine running at 2000 revolution per minute has a carburetor venturi with a 3 cm throat. Determine the suction at the throat assuming the volumetric efficiency of the engine to be 70%. Assume density of air to be 1.2 kg/m^2 and coefficient of air flow 0.8. **(04)**

4A. What is meant by Physical delay in Diesel engine? Explain briefly. **(02)**

4B. Explain how the injection advance angle affect the Ignition Delay period in Diesel engine. **(04)**

4C. With a neat sketch, explain the working principle of Pre-combustion chamber. **(04)**

5A. Enumerate the Advantages of Stirling engine. **(02)**

5B. Clearly explain the working principle of Pneumatic governor. **(04)**

5C. Mention the different types of lubricants used in Automobiles and explain each type briefly. **(04)**