Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

IV SEMESTER B.TECH (Mechanical / Industrial Production Engineering)

END SEMESTER EXAMINATIONS, JUNE/JULY 2016

SUBJECT: AUTOMOBILE ENGINEERING [MME 2204]

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A.	With the help of a neat sketch explain valve timing diagram.	**3**
1B.	With a neat sketch explain the working of worm and worm wheel steering gear.	**3**
1C.	What are the provisions to overcome difficulties at idling and higher speeds? Explain with the help of neat sketches.	**4**
2A.	Sketch and explain the construction and working of sodium cooled valve.	**3**
2B.	A motor car has wheel base of 2.75m, pivot centres are 1.06m apart, front and rear wheel track is 1.23m, angle of inside lock is 38 degrees. Calculate a) the correct angle of outside lock; b) Turning circle radius of inner front and inner rear wheel; c) Turning circle radius of outer front and outer rear wheel.	**3**
2C.	With a neat circuit diagram explain the working of a battery coil ignition system for a 4 cylinder engine.	**4**
3A.	What are the different types of pistons used in automobile engines? Explain any two.	**3**
3B.	Draw the neat sketch and explain pump circulation cooling system.	**3**
3C.	What are the differences between leaf spring and torsion bar?	**4**
4A.	What are the advantages of tubless tyres over tubed tyres? Explain.	**3**
4B.	With a neat sketch explain the working of semi-centrifugal clutch.	**3**
4C.	With a neat sketch explain the working of a pneumatic brake system.	**4**

5A. Determine the size of clutch plate suitable for a car employing single plate type of friction clutch and developing 42kW at 3800rpm. The inside diameter of clutch plate is 0.62 times its outside diameter, and it is to be ensured that even after a loss of 34% of the engine torque due to wear of clutch facing, the clutch does not slip. The intensity of pressure on the surface is not to exceed 71kPa. Consider coefficient of friction as 0.295. **3**

5B. What are the primary and secondary functions of steering system? Also, list the requirements of a good steering system. **3**

5C. What are the differences between hotchkiss and torque tube drives? **4**