Reg. No.										

Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)

V SEMESTER B.TECH (AUTOMOBILE ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2016

SUBJECT: TWO AND THREE WHEELED VEHICLES [AAE 4022]

REVISED CREDIT SYSTEM

Time: 3 Hours (01/12/2016) MAX. MARKS: 50

Instructions to Candidates:

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

1A. Define the following: **(02)**
(1) Ground trail (2) progressive rate spring (3) Carcass (4) slip angle

1B. Describe the read valve charge induction system for two-stroke engines and mention its advantages. **(03)**

1C. What are light alloy wheels? List their advantages. **(02)**

1D. A multi plate clutch used in a motor cycle has 3 discs on driving shaft and 2 on the driven shaft. The inner diameter of contact surface is 120 mm. The maximum pressure between the surfaces is limited to 0.1N/mm^2. Design the clutch for transmitting 25 kW at 1575 rpm. Friction coefficient=0.3 **(03)**

2A. Explain the constructional details and working of a swing arm rear suspension used for three wheeled vehicles. **(03)**

2B. What are the factors that affect the life of automotive tires? **(02)**

2C. Illustrate the working of a pressurized lubrication system for I C engines. For which types of engines is it more applicable? **(03)**

2D. With a circuit diagram, illustrate the functioning of a turn signal indicator. **(02)**

3A. Explain the construction and working of capacitive discharge ignition system for a two-wheeler vehicle engine. **(03)**

3B. With a neat diagram, explain the constructional details of shaft type final drive used in two wheeled vehicles. **(02)**

3C. Suspension system of a scooter is fitted with a helical coiled spring of free length 150 mm. Due to a road jerk of 500 N, it compresses to a length equal to 100mm. If spring index is 10, design the spring. Consider allowable shear stress for spring as 65N/mm^2 and modulus of rigidity as 85GPa. Calculate the spring stiffness and strain energy absorbed by it during the suspension act. **(02)**

3D. Explain the essential features of CNG engine fuel supply system for auto rickshaws. **(03)**

4A. Sketch a layout of complete transmission system used in any one of motor cycles. **(02)**

4B. With a neat diagram demonstrate the working of a sliding caliper type disc brake. **(02)**

4C.	List the various types of frames used for two wheeled vehicles. Explain the essential features of diamond form frame.	**(03)**
4D.	Write short notes on (i) Throttle twist grip (ii) Electric drives for two wheelers	**(03)**
5A.	Illustrate how the straight-line recovery is achieved in two wheeled vehicles after traversing on the turns.	**(03)**
5B.	What are the dynamic requirements of front wheel suspension systems in two wheeled vehicles?	**(02)**
5C.	Differentiate the petrol and diesel engines based on (i) specific fuel consumption (ii) air utilization factor	**(02)**
5D.	Write short notes on (i) constant choke carburetor (ii) Beach handle bar	**(03)**