VIT

Vellore Institute of Technology

Deemed to be University under section 3 of UGC Act 1956

SCHOOL OF MECHANICAL ENGINEERING

Continuous Assessment Test - II, September 2019

B.Tech (*Mechanical Engineering with Spl. In Automotive*), Fall Semester, 2019 - 20

Class Nbr.	: VL2019201001349		
Course Code	: MEE1036	Duration	: 90 Minutes.
Course Name	: Automotive Chassis	Max. Marks	: 50
Faculty-In-Charge :	Dr. Kannan C	Slot	: D1 + TD1

Answer all questions (5 x10 = 50 Marks)

1. A vehicle has to be designed such that it is providing three times softer ride than coil spring suspension. Propose a method to satisfy this design constraint and explain the working of your design with a neat sketch.

2. Suggest a suitable rear axle shaft supporting for heavy-duty vehicles. Explain the construction and working of your proposal with a schematic.

3. The wheelbase of a vehicle travelling on a wet road sloping upwards at an angle of $\theta = \sin^{-1}(0.1)$ is 5 m. Its centre of gravity is 2 m ahead of the rear axle and 750 mm above the road. The coefficient of adhesion between the vehicle tyres and the road is 0.3. The vehicle employs brakes on all the four wheels. Determine:

   (a) The ratio of braking forces on the front and rear wheels if skidding is to be avoided.

   (b) Stopping distance for the vehicle travelling at a speed of 45 km/hr when the engine is stopped and the brakes are applied.

4. Identify the most favourable front independent suspension designs for passenger cars. Elaborate on the construction and working of those suspension systems with neat sketches.

5. One of the rear wheels of FR layout vehicle is getting into a slippery surface. Suggest a suitable mechanism to make the vehicle to come out with ease. Explain the construction and working of your proposed design.

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