VIT
Vellore Institute of Technology

Final Assessment Test – November 2019

Course: MEE2050 - Vehicle Dynamics

Class NBR(s): 1353 Slot: A1+TA1+V1

Time: Three Hours Max. Marks: 100

KEEPING MOBILE PHONE/SMART WATCH, EVEN IN 'OFF' POSITION, IS EXAM MALPRACTICE

PART – A (5 X 12 = 60 Marks)

Answer ALL Questions

1. Select any one single degree of vibration model and analyze the free and forced vibration responses. Also, estimate the magnification and transmissibility for random vibrations.
2. Estimate the stability of high CG truck moving on a slop surface for getting maximum acceleration.
3. Explain the performance of the tyre by the rolling resistance, factors and forces acting on it.
4. Discuss in detail the vehicle handling in possible operating terrains. Justify your comments.
5. Discuss the type of vehicle suspension systems related to control technology.

PART – B (2 X 20 = 40 Marks)

Answer any TWO Questions

6. An engine weighing 1325.1N is to be supported on four helical springs. When the engine speed is 800 rpm there is a primary vertical disturbance force of 284 N due to unbalance reciprocating weights. Assume that the engine vibration in the vertical direction with neither horizontal nor angular movement. Find the stiffness of each spring with total periodic force on the foundation is to be 21.8. What will be the amplitude of vibration of the engine when speed is 600 rpm?
7. Develop the mathematical modelling of three degrees of freedom passenger seat with quarter car model and estimate the passenger comfort and road holding ability.
8. Illustrate the effect of camber angle, thrust, stiffness and scrub radius in the vehicle performance with a suitable explanation.

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