Exam. Code: 0943
Sub. Code: 6746

2074
B.E. (Mechanical Engineering)
Seventh Semester
MEC-703: Vehicle Dynamics

Time allowed: 3 Hours Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Answer the following:-

(a) Differentiate between "engine braking" and "regenerative braking." How do these braking mechanisms impact longitudinal vehicle dynamics?

(b) Explain the purpose of the tread on a tire. How does tread design influence tire performance?

(c) What does lateral force generated by a tire depend upon?

(d) How does vehicle handling relate to a vehicle's vertical motion frequency ?

(e) Compare half and quarter car models in the context of vehicle vertical dynamics. (5x2)

UNIT - I

II. Discuss the various aspects of longitudinal dynamics of Tractor with semi-trailer. (10)

III. With regards to tire mechanics, explain the development of slip, grip and rolling resistance in vehicles. (10)

IV. What is ply steer and conicity. Discuss its importance and impact on longitudinal vehicle dynamics. (10)

UNIT - II

V. How is Mimuro plot for transient response plotted ? What is its significance in analyzing vehicle dynamics? (10)

VI. List and explain all the parameters that affect vehicle handling. What is subjective and objective evaluation of vehicle handling? (10)

VII. Write short notes on:-

(a) Steering Conditions

(b) Harshness

(c) Bicycle Model

(d) Subjective evaluation of vehicle handling (10)

x-x-x