

Extra
(3 Hours)

Q.P. Code : 734300

[Total Marks : 80

- N.B. :** (1) Question No 1 is **compulsory**.
 (2) Answer any **four** questions from remaining.
 (3) Assume suitable data if required.

1. (a) Calculate the Conjugate point for the following data. 8
 Total Mass = 1000 Kg
 Spring Mass = 800 Kg
 Wheel Base = 2.5 m
 Front/Rear weight distribution = 65/35
 Front suspension = 30 KN/m
 Rear Suspension = 50 KN/m
- (b) Explain the Working of Power Steering with neat sketches. 8
2. (a) Explain the influence of windshield angle on drag and deck lid spoilers. 8
 (b) Derive an expression to calculate the value of X_2 for simple spring and mass system of two masses similar to an Automobile. 8
3. (a) Explain the Significance of three link Suspension system. 8
 (b) Explain No Roll suspension and Interconnected suspension system. 8
4. (a) Find Yawing Velocity of a Car when moment 250 NM is acting through CG for the following data. 8
 Mass = 1200 Kg
 Wheel Base = 2.5 m
 $a = 1.4$ m and $b = 0.9$ m
 $C_F = -70\ 000$ N/rad
 $C_R = -75\ 000$ N/rad
 Speed = 90 Km/h
- (b) Explain the working of Steering Mechanism of Passenger Car. 8
5. (a) Explain the Roll geometry for any two Suspension system. 8
 (b) Derive an expression for Steady state yawing response to steering input. 8
6. (a) Explain the mechanism of Air flow around the vehicle with Aerodynamic aids 8
 (b) Explain Equalizing suspension system 8
7. Write short note on any **four** 16
 - (1) Four wheel Steering
 - (2) Vehicle response property
 - (3) Ride and comfort
 - (4) Suspension Motion Ratio
 - (5) Doubly conjugate and its application.