

Con. 5144-09.

SP-6788

(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions from remaining **six** questions.
 (3) **All** questions carry **equal** marks.
 (4) **Support** your answers with **suitable** sketches.

1. Explain the following :— 20
 (i) Hotchkiss drive (ii) Torque tube drive
 (iii) Diferential (iv) Semifloating axle.
2. (a) Explain the following terms with respect to steering geometry :— 10
 (i) Castor (ii) Camber (iii) King pin inclination (iv) Cornering power
 (v) Understeer Oversteer
- (b) Explain Ackerman steering gear. Also prove that for perfect rolling :— 10
- $$\cot \phi - \cot \theta = \frac{c}{b}$$
3. (a) Discuss the requirements of brakes. Compare Pneumatic an Hydraulic brakes. 10
 (b) Explain Antilock braking. 10
4. (a) What is Ergonomics ? How it can be applied in designing driver and passenger seats. 10
 (b) Explain various aerodynamic forces and moments acting on a vehicle while in a motion. Discuss methods to reduce these forces. 10
5. (a) What are integral, semi-integral and open structures. 10
 (b) Explain the terms : 10
 (i) Visibility and blind area (ii) Torsional
 (iii) Normal control (iv) Forward control rigidity.
6. (a) Explain the requirements of a good suspension system. Describe any one type of independent suspension system. 10
 (b) What are the sources of vibrations in a vehicle. Discuss methods to minimize the vibration. 10
7. Write notes on : 20
 (a) Preliminary design
 (b) Chasis sections, Materials and Layouts
 (c) Light weight Automotive materials
 (d) Traction control.
-