

(3 Hours)

[Total Marks : 80]

- N.B: (1) Question no 1 is compulsory.
 (2) Attempt any 3 out of remaining 5 questions.
 (3) Figures to the right indicate full marks.
 (4) Illustrate your answers with sketches wherever necessary.

- 1 a What are nomograms? How they are useful in Vehicle Body Weight analysis? 10
 b Explain Layout of Design and Preliminary design in detail. 10
- 2 a Explain the following with load path: 10
 1) Vertical Symmetric
 2) Vertical Asymmetric
 3) Longitudinal Load
 b What is aerodynamics? Explain various aerodynamic forces and moments acting on the vehicle. 10
- 3 a Explain in detail the following layout of structures with neat diagram for edge forces distribution in torsion and bending: 10
 1) Integral
 2) Open Integral
 3) Semi-Integral
 4) Flat or Punt type
 b Explain Vehicle Body panel terminology. Also define and identify sill panel, cant panel, scuttle panel and rain gutter. 10
- 4 a Explain general principle of the thin walled structures and behaviour in torsion. 10
 b Write short notes on:
 1) Master Model 05
 2) Vehicle Weight Distribution 05
- 5 a Explain various safety aspects incorporated in modern cars. 10
 b Give account of various plastics and rubbers going into automobile. 10
- 6 a What is Ergonomics? How is it used to design Drivers seat? Also explain different types of child seat. 10
 b Explain various power plant locations with its merits and demerits. 10