Total No of Questions: [12] *SEAT NO. :* [ ]

[Total No. of Pages : 2]

B.E. (Mechanical)2008 AUTOMOBILE ENGINEERING

(Semester - I)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Answer any three questions from each section.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Use of Calculator is allowed.*
6) *Assume Suitable data if necessary*

SECTION I

Q1) a) Write note on different types of materials used for chassis frame. [08]

b) What is vehicle specification? Describe specification of any one medium vehicle of your choice. [08]

OR

Q2) a) State different types of vehicle bodies and explain any one in detail. [08]

b) Sketch a neat layout of a four wheel drive & explain its working. [08]

Q3) a) Explain Fluid flywheel with neat sketch [08]

b) Describe with neat sketch function & working of multi-plate clutch. [08]

OR

Q4) a) Explain the working of constant mesh gear box with the help of neat sketch. Also state its advantages & disadvantages. [08]

b) Explain with neat sketch differential unit in the back axle of a vehicle & explain its working. [10]

Q5) a) Define front end geometry for steering including Caster, camber, toe, steering axis inclination & turning radius . [10]

b) Explain how the wheel alignment & its balancing performed in a service station. [08]

OR

Q6) a) Explain with neat sketch construction of stub axle & wheel mounting. [10]

b) Explain with neat sketch construction & working of power steering. [08]

SECTION II

Q7) a) Explain the Rear wheel (Live axle) independent suspension arrangement with the help of neat sketch. State its advantages and applications. [10]

b) State the different materials used in break linear and also explain stopping distance of vehicle in detail. [08]

OR

Q8) a) Explain following basic consideration of suspension system [08]

i)Sprung and unsprung masses

ii)Vertical loading

b) Explain the air brake system in detail, Also state its advantages over the mechanical brake system. [10]

Q9) a) Explain with neat sketch lighting and Horn. [05]

b) Explain the electrical control unit (ECU) in a typical car [05]

c) Write a short note on "Hybrid vehicle" [06]

OR

Q10) Write short note on any four: [16]

1. Speedometer
2. Flashing indicator
3. Traction control device
4. Battery maintenance and care.
5. Electrical car layout

Q11) a) Write a short note on "Road performance curve" [05]

b) Write a note of types of collision [06]

c) Explain "Vehicle interior and Ergonomics" [05]

OR

Q12) a) A passenger car 13349.44 N. The rolling resistance may be assumed as 44.489 N of vehicle weight. The air resistance is given by $0.00017\ AV^2$ where A= frontal area and V is car speed. The frontal area of the vehicle is 2.312 m^2 and car speed is 48.27 km/hr: [10]

(i) Determine the power required to propel the vehicle on level road.

(ii) If the tractive effort available at the wheels is 1859.97, find the maximum gradient which the vehicle can climb.

b) Write short note on Active safety and passive safety. [06]