

Total No. of Questions : 12]

SEAT No. :

P1527

[4759]-38

[Total No. of Pages : 3

**B.E. (Mechanical Engineering)
AUTOMOBILE ENGINEERING
(2008 Course) (Semester-I) (402045 A) (Elective-II)**

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) Explain classification of automobile with the help of examples and give specification of any one petrol car of your choice. [8]

b) Explain with neat sketch layout of a four wheel drive. [8]

OR

Q2) a) Explain front engine front wheel drive vehicle with neat sketch. Write its advantages and disadvantages over the other layouts. [8]

b) State different types of vehicle bodies and explain any one in detail. [8]

Q3) a) Explain with neat sketch construction and working of multi-plate clutch. [8]

b) Explain fluid coupling with neat sketch. [8]

OR

Q4) a) Explain working of sliding mesh gear box with neat sketch. Also state its advantages and disadvantages. [8]

b) Draw a neat sketch of typical differential unit in the back axle of vehicle and explain its working. [8]

P.T.O.

- Q5)** a) Enumerate different types of steering gears. Explain with neat sketch construction and working of power steering unit. [10]
- b) How are the tyres classified and rated. [8]

OR

- Q6)** a) Define front end geometry for steering including castor, camber, steering axis inclination, toe and scrub radius. [10]
- b) Describe various types of stub axles with the help of suitable diagram and state merits and demerits of each of them. [8]

SECTION-II

- Q7)** a) Explain in detail the function and construction of a leaf spring with neat sketch. [8]
- b) Explain ABS (Antilock Braking System) in detail. Also state its advantages over hydraulic brake system. [10]

OR

- Q8)** a) Explain the independent front suspension arrangement with the help of neat sketch. State advantages of it. [10]
- b) Explain with neat sketch the working of hydraulic brakes. [8]

- Q9)** a) Sketch and describe the components and operation of a battery used in automobile. [8]
- b) Explain with lay out lighting system of any typical car. [8]

OR

Q10) Write short notes on Any Four: [16]

- a) Vehicle charging system.
- b) Dash board instruments.
- c) Electronic stability control.
- d) Sensors and actuators.
- e) Preventive maintenance of vehicle.

Q11) Write short notes on Any Four:

[16]

- a) Seat belts.
- b) Ergonomic consideration for vehicle.
- c) Vehicle performance curve.
- d) Vehicle interior.
- e) Air bags.

OR

Q12)a) Explain in details Active safety and Passive safety.

[6]

- b) A passenger car 13348.56 N. The rolling resistance may be assumed as 44.78 N of vehicle weight. The air resistance is given by $0.00018 AV^2$ where A is frontal area and V is car speed. The frontal area of the vehicle is 2.324 m^2 and car speed is 48.54 km/hr. **[10]**
 - i) Determine the power required to propel the vehicle on level road.
 - ii) If the tractive effort available at the wheel is 1860.27, find the maximum gradient which the vehicle can climb.

