Total No. of Questions : 12]

SEAT No. :

P3318

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

Time :3Hours] *[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) What is chassis? Compare conventional chassis frame with frameless type chassis frame. **[8]**

b) Explain with neat sketch different types of vehicle bodies. **[8]**

OR

Q2) a) What are vehicle specifications? Describe specification of any one light motor vehicle of your choice. **[8]**

b) Sketch a typical layout of a passenger car and briefly describe its various parts. **[8]**

Q3) a) How do you classify clutches? Explain with neat sketch operation of electromagnetic clutch. **[10]**

b) Describe the synchronization mechanism used in synchromesh gear box. **[6]**

OR

Q4) a) Write notes on following: **[10]**

i) Continuous variable transmission

ii) Electronic transmission control

b) Explain with neat sketch the function of differential in rear axle. **[6]**

P.T.O.

Q5) a) Explain with neat sketch construction of stub axle and wheel mounting. **[8]**

b) Explain wheel alignment and wheel balancing in details. **[10]**

OR

Q6) a) Explain with neat sketch construction and working of collapsible steering. **[8]**

b) How are the tyres classified? What are the advantages of tubeless tyre over tubed tyre. **[6]**

c) Write the purpose and requirement of front axle. **[4]**

SECTION-II

Q7) a) What is interconnected suspension? Sketch and describe in briefly. **[9]**

b) Explain air brake system in detail. Also state its advantages over hydraulic brake system. **[9]**

OR

Q8) a) Explain ABS brake system in detail. Also state its advantages over other braking system. **[9]**

b) Explain hydro gas suspension system. Also write its advantages. **[9]**

Q9) a) Explain in brief electrical car layout. **[6]**

b) Explain with neat sketch wiper mechanism. **[5]**

c) Explain with neat sketch lead acid battery. **[5]**

OR

Q10) Write short notes on any Four: **[16]**

a) Vehicle starting system

b) Electronic stability control

c) Sensors and actuators

d) Dash board instruments

e) Vehicle charging system

Q11) Write short notes on any Four: **[16]**

a) Vehicle safety

b) Seat belts

c) Vehicle interior

d) Vehicle performance curve

e) Types of collisions

OR

Q12) a) Explain different vehicle body moments. **[6]**

b) For typical motor car, the road resistance is given by 23N per 1000N, the air resistance by the expression $0.0827V^2$, transmission efficiency 88% in top speed; car weights 19934N when filly loaded. Calculate

i) The bkW required for a top speed of 144km/h

ii) The acceleration in m/s^2 at 48 km/h, assuming the torque at 48 km/h in the top gear 25% more than at 144 km/h

iii) The bkW required to drive the car up a gradient of 1in 5 at 48km/h, transmission efficiency 80% in bottom gear. The resistance being in N and V the speed in km/h and g = acceleration due to gravity = 9.81 m/s^2 **[10]**