Total No. of Questions : 10]

SEAT No. :

P3882

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B.E. (Mechanical)

AUTOMOBILE ENGINEERING

(2015 Course) (Semester-I) (Elective-II) (402045 A)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of electronic pocket Calculator is allowed.***
5) ***Assume suitable data, if necessary.***

Q1) a) Describe the classification of Automobile. **[5]**

b) What are the functions of frame? List three types of chassis construction. **[5]**

OR

Q2) a) What is an over drive? Explain the working of it. **[5]**

b) What is the function of clutch? Discuss various factors affecting the torque transmission in a clutch. **[5]**

Q3) a) Sketch the construction of front axle of automobile. Describe with neat sketch front wheel-stub axle assembly. **[5]**

b) State the requirements of an automobile wheel. Explain with neat sketch construction of Disc type wheel. **[5]**

OR

Q4) a) Describe with neat sketch concept of toe in and toe out. What is purpose of it? **[5]**

b) Explain various considerations for the design of tyre treads. **[5]**

P.T.O.

Q5) a) What is purpose of independent suspension? Explain with neat sketch McPherson strut front independent suspension system. **[8]**

b) Describe construction and working of disc brakes and compare with conventional drum brake system. **[8]**

OR

Q6) Write short note on the following: (Any two) **[16]**

a) Mechanical Brake.

b) Leaf Spring construction and Types.

c) Hydro gas Suspension.

d) Power assisted brakes.

Q7) a) For a Car, the road resistance if given by 23 N per 1000 N, the air resistance is 0.0827 V^2, transmission efficiency is 88 percent in top speed, Car weight 19934 N when fully loaded. Calculate: **[8]**

i) The engine power required for a top speed of 144 km/hr.

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

iii) The power required to drive the car up to a gradient of 1 in 5 at 48 km/h, transmission efficiency 80% in bottom gear.

Consider g = 9.81 m/s^2

b) List and discuss ergonomic consideration in design of interior of automobile. **[8]**

OR

Q8) a) What is purpose of servicing of vehicle? What are advantages of it? Discuss servicing schedule of a light motor vehicle. **[8]**

b) What are the type of drive motor used in Electric vehicle? Which is the best one? Why? Explain. **[8]**

Q9) a) Describe various tests carried out to check battery condition. **[9]**

b) What sensors are used on engine of automobiles? Describe the purpose of each. **[9]**

OR

Q10) Write short note on the following (any three): **[18]**

a) Battery for electric vehicles.

b) Oil and Temperature gauges.

c) Maintenance of Clutch.

d) Layout of HEV.

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