Total No. of Questions : 10]

SEAT No. :

P2992

[Total No. of Pages : 2

[5154]-556-B

B.E. (Mechanical)

AUTOMOBILE ENGINEERING

(2012 Course) (Semester - II) (402049DB) (Open Elective - Elective - III)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
4) ***Assume Suitable data, if necessary.***
5) ***All questions are compulsory.***

Q1) a) Explain the various sections used for side members and cross members of chassis frame. **[4]**

b) What is purpose of clutch plate? Explain with any kind of clutch plate used in automobile. Explain functions of various components of it. **[6]**

OR

Q2) a) What are different types of loads acting on vehicle frame and explain them. **[4]**

b) Explain the working of Synchromesh gear box with the help of neat sketch. **[6]**

Q3) a) Explain with the neat sketch layout of steering linkage for vehicle with rigid axle front suspension. **[6]**

b) What are the different factors which affecting tyre life? **[4]**

OR

Q4) a) Define with neat sketches the following terms related to steering geometry. **[6]**

i) Camber

ii) Castor

iii) Steering axis inclination

iv) Combined angle

b) Define the steering ratio? And discuss the reversibility of steering. **[4]**

P.T.O.

Q5) a) Explain with neat sketch the layout of Air brake system in details. Also state its advantages over the hydraulic brake system. **[10]**

b) What are interconnected suspension? Sketch and describe in briefly. **[8]**

OR

Q6) a) Explain with neat sketch of Hydro gas suspension system in details. Also state its advantages and disadvantages. **[10]**

b) Sketch and describe the disc brakes. Also state its advantages over the drum brake. **[8]**

Q7) Write a short notes on any four: **[16]**

a) Vehicle interior and ergonomics.

b) Air bags & seat belt.

c) Hybrid vehicles.

d) Measuring instruments for wear.

e) Vehicle performance curve.

OR

Q8) a) Necessity of NVH analysis in automobile, explain in details. **[8]**

b) A passenger car travelling at 80.45 KM/Hr. is accelerated up a gradient of 1 in 20. The gross vehicle weight is 11026.4N. It has a frontal area of 1.858 m^2 and the air resistance coefficient may be assumed as 0.0167. The rolling resistance is 221.7N. At the above speed, the engine develops 58.88 KW at engine speed of 4000 RPM. Rear axle ratio is 5:1 and transmission efficiency = 95%.

Calculate:

i) The total tractive resistance. **[3]**

ii) The tractive effort available at the wheel. **[3]**

iii) The acceleration while ascending the above gradient. **[2]**

Q9) a) Explain the working with neat sketch of Horn and windscreen wiper. **[8]**

b) Explain with neat sketch of lead acid battery. State its rating capacity. **[8]**

OR

Q10)a) Explain oxygen sensors, cranking sensor, speed sensor and fuel metering sensor in vehicle. **[8]**

b) Explain the vehicle maintenance chart for clutch, gear box, propeller shaft & tyres. **[8]**