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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Sixth Semester, B.E. - Automobile Engineering

Semester End Examination; May / June - 2018

Automotive Chassis and Suspension

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.*
ii) Use of Design Data Handbook is permitted.
iii) Missing data, if any, suitably assumed.

UNIT - I

1 a. Explain different types of automobiles in detail. 10

b. Draw typical road speed versus power available at wheels curves for different given ratios and explain the same. 10

2 a. For a typical motor car, the road resistance is given by 23 N per 1000 N, the air resistance by expression 0.827 V^2, the transmission efficiency 88% in top speed. Car weighs 19934 N when fully loaded. Calculate; 10

i) Brake power required for top speed of 144 km/hr

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

b. Sketch and explain different form of sections used in construction of chassis frames. Compare the relative merits. 10

UNIT - II

3 a. Sketch a front wheel stub axle assembly and label the parts. 10

b. Discuss the importance of wheel alignment. Explain the different terms used in wheel alignment geometry. 10

4 a. Explain an independent suspension steering linkage with a neat layout. 10

b. With a neat sketch, describe a screw and nut steering mechanism. 5

c. Write a note on power steering. 5

UNIT - III

5 a. With the help of a diagram, explain how the speed of Hooke type universal joint varies due to drive and drives shaft inclination? 10

b. Discuss the force analysis of Hotchkiss drive. 10

6 a. Sketch a semi floating rear axle construction and name its components. Mention the loads and stresses acting on the axle shaft of a semi floating rear axle. 10

b. Explain the working of a differentiation with suitable diagram. 10

Contd…2

UNIT - IV

7 a.	How braking systems can be classified?	6
b.	With a neat layout, explain a hydraulic braking system.	10
c.	Compare the advantages of disc brakes with drum brakes.	4
8.	Explain following :	
	i) Air brake ii) Vacuum brake	20
	iii) Exhaust brake iv) Parking brake.	

UNIT - V

9 a.	List the advantages and disadvantages of front independent suspension system over rigid suspension.	10
b.	With a neat sketch, explain constitutional details of a telescopic shock absorber.	10
10 a.	How wheels and tyres are specified? Explain with examples.	5
b.	Discuss the static and dynamic properties of pneumatic tyres.	10
c.	Discuss the factors affecting tyre life.	5

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