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10AU61

Sixth Semester B.E. Degree Examination, June/July 2015
Automotive Chassis and Suspension

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. In brief explain classification of automobiles. **(10 Marks)**

b. Draw and explain transmission system for four wheel drive vehicle. **(10 Marks)**

2 a. With help of neat sketch, explain different loads acting on chassis frame. **(10 Marks)**

b. What are the different cross-sections used for chassis frame? Explain. **(06 Marks)**

c. What do you mean by torque reaction? Explain. **(04 Marks)**

3 a. Explain construction of front axle. **(06 Marks)**

b. Explain following with neat sketch:
i) Camber ; ii) Castor ; iii) King pin inclination; iv) Toe-in and Toe-out. **(08 Marks)**

c. A track has pivot pins 1.37m apart, the length of each track arm is 0.17m and the track rod is behind the front axle and 1.17m long. Determine the wheel base which will give true rolling for all wheels when car is turning, so that the inner wheel stub axle is 60° to the center line of the car. **(06 Marks)**

4 a. What is the need of differential in automobile? Discuss working principle of differential. **(08 Marks)**

b. Sketch and explain Hotch Kiss drive used in automobile. **(06 Marks)**

c. Explain construction of semi-floating and full floating rear axle with a neat sketch. **(06 Marks)**

PART – B

5 a. With neat sketch, explain working of disc brakes. Also mention its advantages over drum brakes. **(08 Marks)**

b. List the desirable properties of brake fluid. **(04 Marks)**

c. Draw and explain working of pneumatic brakes (air brakes) used in automobiles. **(08 Marks)**

6 a. What is the function of hill holder in automobiles? Explain its working with neat sketch. **(08 Marks)**

b. A motor car weighs 13341.5N and has wheel base of 2.65m. The C.G. is 1.27 behind the front axle and 0.76m above the ground level. Maximum braking on all four wheels on level ground will bring the vehicle uniformly to rest from a speed of 64 kmph in a distance of 25.9 met. Calculate the value of adhesion between tyre and the road.
Under same condition, a vehicle descends a hill of gradient 1 in 20 and is braked on front wheel only. Determine the load distribution between front and rear wheels and the distance required to bring the car to rest. **(12 Marks)**

7 a. With neat sketch, explain construction of leaf spring. **(06 Marks)**

b. Write the advantages of independent suspension as compared to rigid axle suspension system. **(04 Marks)**

c. Draw and explain construction and working of hydraulic shock absorber. **(10 Marks)**

8 a. Write various requirements of automobile wheel. **(06 Marks)**

b. Explain construction of radial ply tyre with neat sketch. **(06 Marks)**

c. Explain various factors affecting tyre life. **(08 Marks)**

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