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10AU61

Sixth Semester B.E. Degree Examination, June/July 2018
Automotive Chassis and Suspension

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Derive expressions for stability of a vehicle on a slope. (06 Marks)
 b. A car weighting 21336.75N has a static weight distributor on the axles of 50:50. The wheel base is 3mt and height of the centre of gravity above the ground is 0.55mt. If the coefficient of friction on the highway is 0.6, calculate the advantage of having rear wheel drive rather than front wheel drive as per as gradiability is concerned, if the engine power is not limitation. (14 Marks)
- 2 a. Draw the layout of typical chassis frame show all the components mounted on it. (08 Marks)
 b. What are the different cross sections used for construction at chassis frame? Mention their relative merits. (08 Marks)
 c. What are the various loads acting on the chassis frame? (04 Marks)
- 3 a. What is camber and caster angle? How does both help to produce directional stability? (06 Marks)
 b. Derive an expression for fundamental condition for true rolling. (08 Marks)
 c. A motor car has a wheel base of 2.743mt and pivot centre of 1.065m. The front and rear wheel truck is 1.217mt. Calculate the correct angle of outside lock and turning circle radius of the outer front and inner rear wheels when the angle of inside lock is 40°. (06 Marks)
- 4 a. Explain construction and working of differential. (08 Marks)
 b. Explain construction of semi floating and full floating rear Axle with a neat sketch. (06 Marks)
 c. Sketch and explain Hotchkiss drive used in Automobile. (06 Marks)

PART – B

- 5 a. Compare disc brake and drum brakes. (06 Marks)
 b. List the desirable properties of brake fluid. (04 Marks)
 c. A motor car has a wheel base of 2.64m the height of its C.G above the ground is 0.61mt and it is 1.12mt in front of the rear axle, if the car is travelling at 40km/hr on a level track determine the minimum distance in which the car may be stopped, when
 - i) The rear wheels are braked
 - ii) The front wheels are braked
 - iii) All wheels are braked. (10 Marks)
- 6 a. Discuss briefly :
 - i) Hand brake (parking brake)
 - ii) Hill Holding derive (10 Marks)
- b. Explain with a neat sketch, the working of pneumatic brakes used in automobiles, what are its merits compared to hydraulic brakes. (10 Marks)

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- 7 a. What is the purpose of independent suspension? How is it achieved in front and rear axles
Explain with neat sketches. (10 Marks)
- b. Explain with a neat sketch :
i) Hydraulic suspension
ii) Rubber suspension (10 Marks)
- 8 a. Describe with sketches the construction of :
i) Disc wheel (10 Marks)
ii) Wire wheel (06 Marks)
- b. Explain radial ply tyre with neat sketch (06 Marks)
- c. Explain various factors affecting tyre life. (04 Marks)

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