

--	--	--	--	--	--	--	--	--	--



# 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; July / Aug. - 2022

**Automotive Chassis and Suspension**

Time: 3 hrs

Max. Marks: 100

**Note:** Answer **FIVE** full questions, selecting **ONE** full question from each unit.

## UNIT - I

- 1 a. How automobile is classified? Explain in detail. 10
- b. Explain the traction and tractive effort and mention the relationship between the engine and vehicle speed. 10
- 2 a. What are the functions of chassis frame, and explain the types of chassis frame design. 10
- b. Explain the principle of testing of frame and also explain the bending and torsion test of frame. 10

## UNIT - II

- 3 a. State the function of front axle. Sketch a typical front axle and describe it. 10
- b. Explain the following with neat sketch; 10  
Camber, caster king pin inclination, Toe in-out, under steer.
- 4 a. Explain the construction and working of power steering system. 10
- b. Derive the expression for the steering mechanism which will satisfy the condition for perfect steering. 10

## UNIT - III

- 5 a. Explain the basic types of universal joint. 10
- b. Describe the analysis of Hook's joint with velocity, speeds, fluctuation, and acceleration. 10
- 6 a. Enlist the different types of rear wheel drive arrangements and explain any one with sketch. 10
- b. Explain the different types of semi floating axle hubs, with neat sketches. 10

## UNIT - IV

- 7 a. Explain the following terms related to Braking System; 10  
Break, efficiency, brake shoe, brake torque stopping distance.
- b. Sketch and explain disc brake constructional details. 10
- 8 a. Sketch the layout of single line hydraulic braking system and explain. 10
- b. Explain; i) Power brake and ii) Vacuum brake. 10

## UNIT - V

- 9 a. Sketch and explain the different types of suspension springs. 10
- b. Sketch and explain the telescope shock absorber. 10
- 10 a. Explain construction and working of tubeless pneumatic tyre with neat sketch. 10
- b. List the factors affecting tyre life and material used to manufacture tyres. 10