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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; July / Aug. - 2022

Automotive Chassis and Suspension

Time: 3 hrs *Max. Marks: 100*

Course Outcomes

The Students will be able to:

CO1: Identify different chassis layouts and frames and analyze for performance automobiles and suitability of frames.

CO2: analyze front axles and steering systems and its auxiliaries and determine major dimensions of the same

CO3: Analyze propeller shaft, differential and rear axle and it's auxiliaries and determine major dimension of the same.

CO4: Analyze braking system and determine major dimension of the same.

CO5: Analyze suspension system and wheel and tires. Also determine major dimension of the suspension system.

***Note: I) PART - A** is compulsory. **Two** marks for each question.*

***II) PART - B**: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.*

***III)** Draw neat sketches whenever necessary. Use of Designed Data hand book is permitted.*

Q. No.		Questions	Marks	BLs	COs	POs
		I : PART - A	**10**			
I	a.	What are the materials used for Automobile frame?	2	L1,2	CO1	PO1
	b.	What do you mean by self-righting torque?	2	L1,2	CO2	PO1
	c.	What are different trans-axles?	2	L1,2	CO3	PO1
	d.	Define brake efficiency.	2	L1,2	CO4	PO2
	e.	How a tyre is specified? Give an example.	2	L1,2	CO5	PO1
		II : PART - B	**90**			
		UNIT - I	**18**			
1	a.	Explain with sketch any three types of automobiles.	9	L2	CO1	PO1
	b.	With sketch, explain different cross sections used for frame of an automobile. Give their merits and demerits.	9	L2	CO1	PO1
	c.	Write the procedure for different tests conducted on frame.	9	L2	CO1	PO1
		UNIT - II	**18**			
2	a.	What is the necessity of wheel alignment? Explain with sketch different steering angles.	9	L1	CO2	PO2
	b.	Draw the layout for steering system and mention the function of each component.	9	L2	CO2	PO1
	c.	With neat diagram, explain working of a hydraulic power steering system.	9	L2	CO2	PO1

Contd… 2

	UNIT - III	**18**			
3 a.	Give the analysis of simple Hooke's joint.	9	L3	CO3	PO2
b.	Describe the construction and working of a differential.	9	L2	CO3	PO2
c.	With sketch, explain full floating and semi floating arrangement of rear axle.	9	L2	CO3	PO2
	UNIT - IV	**18**			
4 a.	Obtain an expression for braking torque in a drum brake.	9	L3	CO4	PO2
b.	Draw a layout of hydraulic braking system.	9	L2	CO4	PO2
c.	Explain the required properties of brake fluid. Name two brake fluids.	9	L2	CO4	PO1
	UNIT - V	**18**			
5 a.	Sketch and explain rigid axle suspension of a truck.	9	L2	CO5	PO1
b.	Explain construction and working of Telescopic shock absorber.	9	L2	CO5	PO1
c.	Explain factors affecting tyre life.	9	L2	CO5	PO1

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