U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VII**
Branch: Mechanical Engineering **Duration: 3 hrs.**
Course: 22ME7PEAUE **Max Marks: 100**
Course Code: Automotive Engineering

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

		UNIT - I	CO	PO	Marks
1	a)	With a block diagram discuss the operational features of Engine management system.	*CO1*	*PO2*	**10**
	b)	Explain with a neat sketch the working principal of Exhaust Gas Recirculation (EGR)System.	*CO1*	*PO2*	**10**
		OR			
2	a)	List and explain Basic Engine Components, their functions and materials.	*CO1*	*PO2*	**10**
	b)	With a line diagram, discuss the working principle of forced circulation water cooling system.	*CO1*	*PO2*	**10**
		UNIT - II			
3	a)	How the following parameter affect the performance of the vehicles explain with equations in brief, i)Driving force ii) Engine Power.	*CO2*	*PO3*	**10**
	b)	How the following parameter affect the performance of the vehicles explain with equations in brief, i) Rear axle ratio ii) Speed.	*CO2*	*PO3*	**10**
		OR			
4	a)	Discuss the performance of the vehicles with respect to following parameters, i)Air Resistance ii) Rolling Resistance iii) Gradient resistance iv) Acceleration.	*CO2*	*PO2*	**16**
	b)	Explain why the engine torque is important.	*CO2*	*PO2*	**04**

			UNIT - III			
	5	a)	With a neat sketch describe the working principle of the epicyclic gear box.	*CO3*	*PO2*	**08**
		b)	Describe the different stages of combustion in CI Engine, Mention reasons for knocking.	*CO3*	*PO2*	**08**
		c)	Differentiate between Manual and Automatic Gear Boxes.	*CO3*	*PO2*	**04**
			OR			
	6	a)	Sketch and explain Torque Convertors.	*CO3*	*PO2*	**06**
		b)	Sketch and explain Hotchkiss Drive and Torque Tube Drive.	*CO3*	*PO2*	**08**
		c)	Sketch and explain Single plate Clutch.	*CO3*	*PO2*	**06**
			UNIT - IV			
	7	a)	With a neat sketch and explain Caster, Camber, and King pin inclination.	*CO4*	*PO2*	**12**
		b)	Derive an expression for the distribution of forces on rear and front wheels of four wheeled vehicle when brakes are applied to rear wheels separately	*CO4*	*PO3*	**08**
			OR			
	8	a)	With a simple sketch describe the working of the differential gear system when the vehicle taking right turn.	*CO4*	*PO2*	**08**
		b)	With a neat sketch and explain Air Brake system, write its advantages.	*CO4*	*PO2*	**08**
		c)	Explain Types of Springs used in Suspension system.	*CO4*	*PO2*	**04**
			UNIT - V			
	9	a)	With a diagram, explain the working of starting system in an automobile.	*CO4*	*PO2*	**08**
		b)	With a block diagram, describe the power flow in series hybrid vehicle.	*CO4*	*PO2*	**06**
		c)	Describe the salient features of using Methanol as an alternative fuel.	*CO4*	*PO2*	**06**
			OR			
	10	a)	Sketch and explain Fuel Cell, and write its applications.	*CO4*	*PO2*	**10**
		b)	Explain Electrical and Electronic system in an automobile.	*CO4*	*PO2*	**10**

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