Reg.No: | | | | | | | |

SNS College of Technology, Coimbatore-35.
(Autonomous)
B.E/B.Tech- Internal Assessment -I
Academic Year 2023 – 2024 (Odd)
Fifth Semester
Automobile Engineering
19AUT302 – VEHICLE DYNAMICS AND STRUCTURES

B

Time: 1 1/2 Hours **Maximum Marks: 50**

Answer All Questions

PART - A (5 x 2 = 10 Marks)

		CO	Blooms
1	Analyze the value for air resistance for a vehicle at Stationary condition.	CO1	Ana
2	Mention the various resistance offered to a vehicle motion.	CO1	Rem
3	Define Tractive Effort	CO1	Rem
4	Analyze the various tire moments	CO2	Ana
5	Identify the modification that can be done in tire design to perform well in wet surface	CO2	Ana

PART – B (40 Marks)

6	(a)	An engine is required to power weight of a vehicle 40937 N. Engine speed is 2400 rpm, maximum grade the vehicle to negotiate at 32 km/ hr in second gear to be 15%. Rolling Resistance coefficient is 0.017. Air resistant coefficient is 0.0324. Frontal area is 5.2 m^2. Efficiency of transmission is 80%. Wheel radius is 0.419 m. Final drive ratio is 3.92:1. Find the Gearbox ratio and Power required.	13	CO1	App
		(or)			
	(b)	For a typical motor car, the road resistance is given by 23N per 1000N, the air resistance is given by expression $0.0827V^2$. Transmission efficiency is 88% in top speed, car weights 19934 N when fully loaded. Calculate (a) Power Required for a top speed of 144 km/hr, (b) Acceleration at 48 km/hr, assuming the torque at 48 km/hr in the top gear is 25% more than at 144 km/hr, (c) The power required to drive the car up a gradient of 1 in 5 at 48km/hr, the transmission efficiency is 80% in bottom gear. The resistance being in N and V the speed in km/hr and g= acceleration due to gravity = $9.8 m/s^2$	13	CO1	App
7	(a)	Examine the cornering property of tire in detail.	13	CO2	Ana
		(or)			
	(b)	Analyze the performance parameters of tire on wet surfaces in detail.	13	CO2	Ana

8.	(a)	Inspect the assumptions that need to be carried out while designing a vehicle.	14	**CO1**	**Ana**
		(or)			
	(b)	Analyze the various forces and moments of Tire with a neat sketch	14	**CO2**	**Ana**