UPES
End Semester Examination, May 2023

Course: Automobile Engineering   Semester: 6th
Program: B.Tech (Mechanical Engineering)   Time: 03 hrs.
Course Code: MEAD 3010   Max. Marks: 100
Instructions: Section-A Attempt all questions
              Section-B Attempt all questions, in Q9 answer any one
              Section-C Attempt all questions, in Q11 answer any one
              Make suitable assumptions whenever necessary

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	How do you view an automobile of today and in future?	4	CO1
Q 2	What are the classifications of a light motor vehicle?	4	CO1
Q 3	What are the disadvantages of an independent suspension system?	4	CO1
Q 4	Discuss the various characteristics of a battery.	4	CO1
Q 5	How does positive camber differ from negative camber?	4	CO1

SECTION B
(4Qx10M= 40 Marks)

Q 6	What are the functions of the steering system? What are the components of the steering system?	10	CO1
Q 7	Why is lead acid battery suitable choice for an automobile even today?	10	CO1
Q 8	What are the characteristics differences of straight tooth and helical tooth spur gears?	10	CO2
Q 9	A friction clutch is required to transmit 33.12kW at 2000rpm. It is to be of single plate disc type with both sides of the plate	10	CO3

	effective, the pressure being applied axially by means of springs and limited to 6.87×104Pa. If the outer diameter of the plate is to be 0.305m, find the required inner diameter of the clutch ring and the total force exerted by the springs. Assume the wear to be uniform and coefficient of friction 0.3. Or What are bore and stroke of an engine? What is clearance volume, piston displacement and compression ratio?		
	SECTION-C (2Qx20M=40 Marks)		
Q 10	An engine working on constant volume cycle has a clearance volume of 1 litre and stroke volume of 6 litres. The suction pressure and temperature are 1bar and 20ºC respectively. The pressure at the end of heat addition is 25bar. Determine (i) Pressure and volume at salient point of the cycle (ii) Thermal efficiency (iii) Work done per cycle (iv) Mean effective pressure [Take Cv heat addition and rejection=0.807 & 0.737kJ/kg.K; $\gamma=1.4$].	20	CO3
Q 11	Define the following? (a) Caster angle (b) Camber angle (c) Toe-in (d) Toe-out Or What is the function of brake lining? What are the various materials used for brake lining?	20	CO2