Q. Code: 842610

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

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Fourth Semester

AE22408 – AUTOMOTIVE CHASSIS COMPONENTS: THEORY AND PRACTICES

(Automobile Engineering)

(Regulation 2022)

TIME: 2 HOURS **MAX. MARKS: 60**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Compare the different types of chassis layout, frames, steering systems and explain the front wheel geometry.	**3**
CO 2	Explain the concepts of drive line and its components.	**3**
CO 3	Select the rear axle, wheel, rim and tyre for a given vehicle.	**3**
CO 4	Compare the characteristics of different types of suspension springs and explain the construction/working of different types of suspension systems.	**3**
CO 5	Explain the construction/working of different types of braking systems and its components.	**3**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Identify the vehicle configurations that commonly feature front-mounted engines and rear-wheel drive, and provide a justification for this design choice.	**1**	**3**
2.	Discuss the advantages of using a negative camber angle for the front wheels of a sports car.	**1**	**2**
3.	How is comfort ensured in the suspension system of a torque tube drive system?	**2**	**2**
4.	Why two universal joints are used in propeller shaft?	**2**	**2**
5.	In what ways does integral rear axle housing enhance the structural integrity of vehicles?	**3**	**2**
6.	What does the number "55" represent in the tire specification "205/55R16 79V"?	**3**	**2**
7.	Differentiate rigid axle suspension with that of independent suspension.	**4**	**3**
8.	What is the function of shackle with a leaf spring?	**4**	**2**

9.	List out the various factors affecting 'stopping distance' of a vehicle during braking.	**5**	**2**	
10.	What are the advantages of air braking system?	**5**	**2**	

PART- B (3 x 10 = 30 Marks)

		Marks	CO	RBT LEVEL
11. (a)	Enumerate the types of chassis layout according to the power plant location. Describe with a neat sketch the salient features of any one of the layout of a vehicle with its relative merits and demerits.	**(10)**	**1**	**3**
	(OR)			
(b)	With the help of suitable illustration explain the electric power assisted steering system.	**(10)**	**1**	**3**
12. (a)	Discuss about various types of rear axles with respect to construction and load acting on it.	**(10)**	**3**	**3**
	(OR)			
(b)	Provide recommendations for optimizing tire selection based on specific driving requirements, considering the comparative analysis of cross-ply and radial-ply tire characteristics.	**(10)**	**3**	**3**
13. (a)	Identify the suspension system commonly used in heavy commercial vehicles and explain its construction and working principles with the neat sketches.	**(10)**	**4**	**3**
	(OR)			
(b)	Explain with a neat sketch any two different types of independent front suspension system and write down the merits of the system.	**(10)**	**4**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.14 is compulsory)

		Marks	CO	RBT LEVEL
14.	Illustrate the architecture of moder braking system used in automotive vehicles, detailing its components and their interactions. Explain how this system prevents wheel lockup during braking, emphasizing its role in enhancing vehicle safety.	**(10)**	**5**	**3**

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