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Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)

B. Tech(Fifth Semester - Regular) Examinations, November – 2024

22BMEPE35001- Automobile Engineering

(Mechanical Engineering)



Time: 3 hrs

Maximum: 70 Marks

Answer ALL questions
(The figures in the right hand margin indicate marks)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer **ALL** questions

	CO #	Blooms Level
a. List out the main units of an automobile chassis.	CO1	K1
b. Difference between a semi-floating and full-floating rear axle.	CO2	K1
c. Describe camber in front-wheel geometry.	CO3	K2
d. Describe the function of ignition system.	CO4	K1
e. Name the different types of batteries used in electric vehicles (EVs)	CO4	K1

PART – B

(15 x 4=60 Marks)

Answer **ALL** the questions

	Marks	CO #	Blooms Level
2. a. Discuss the various factors that determine the power required for vehicle propulsion.	8	CO1	K1
b. Explain the design of a brake drum and brake lining, and their interrelationship in a braking system.	7	CO1	K2
(OR)			
c. Explain the differences between front, rear, and all-wheel braking systems in vehicles.	8	CO1	K1
d. Discuss the working principle and advantages of power brakes in vehicles.	7	CO1	K2
3.a. Describe the components and working of a semi-automatic and fully automatic transmission system.	8	CO2	K1
b. Discuss the working principle and applications of a torque converter in an automatic transmission.	7	CO2	K1
(OR)			
c. Compare and contrast the sliding mesh, constant mesh, and synchromesh gearboxes.	7	CO2	K3
d. Explain the design and operation of a 4-speed gearbox with an overdrive gear.	8	CO2	K2
4.a. Explain the types of steering geometry, including camber, caster, kingpin inclination, toe-in, and toe-out. How do they affect vehicle handling?	8	CO3	K2
b. Describe the working of a Battery ignition system with suitable diagram. Mention its advantages and disadvantages.	7	CO3	K3
(OR)			
c. Explain the operation of a power steering system with both hydraulic and pneumatic assistance.	8	CO3	K3
d. Explain the working principle and advantages of the Capacitor Discharge Ignition (CDI) system.	7	CO3	K2
5.a. Explain the working of an automobile's charging system, including the main components involved.	8	CO4	K4

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| b. | Discuss the environmental impact of electric vehicles (EVs) compared to traditional internal combustion engine (ICE) vehicles. | 7 | CO4 | K3 |
| (OR) | | | | |
| c. | Describe the components and operation of an electric vehicle (EV). | 8 | CO4 | K2 |
| d. | Describe the advantages of electric vehicles (EVs) in terms of operational performance and efficiency? | 7 | CO4 | K1 |

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