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Question Paper Code	12360
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**B.E. / B.Tech - DEGREE EXAMINATIONS, NOV / DEC 2023**

Fifth Semester

**Mechanical Engineering**

**20MEPC501 - AUTOMOTIVE SYSTEMS**

(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |  | <i>Marks,<br/>K-Level, CO</i> |
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| 1. List out the forces acting on a chassis frame.                | <i>2,K1,CO1</i>               |
| 2. Differentiate between front wheel drive and rear wheel drive. | <i>2,K2,CO1</i>               |
| 3. What is the advantage of CRDI system?                         | <i>2,K1,CO2</i>               |
| 4. State the purpose of turbocharger.                            | <i>2,K2,CO2</i>               |
| 5. What are the requirements of an automotive transmission?      | <i>2,K1,CO3</i>               |
| 6. State the function of differential unit.                      | <i>2,K1,CO3</i>               |
| 7. Define steering gear.   | <i>2,K1,CO4</i>               |
| 8. Distinguish between disc brake with drum brake.               | <i>2,K2,CO4</i>               |
| 9. What is gasohol?  | <i>2,K1,CO5</i>               |
| 10. Mention atleast two merits of a hybrid electric vehicle.     | <i>2,K1,CO5</i>               |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

11. a) Explain the construction of various frames used in automobiles with neat sketch. *13,K2,CO1*
- OR**
- b) Explain the different parts of an engine with their functions and materials used with neat sketch. *13,K2,CO1*
12. a) With a neat sketch explain the electronically controlled gasoline injection system for SI engine. *13,K2,CO2*
- OR**
- b) Describe in detail the functioning of a capacitive discharge ignition system with a neat sketch. List its merits over a transistorized coil ignition system. *13,K2,CO2*

13. a) State the need for a clutch in an automobile. Describe the diaphragm operated clutch system with a sketch. *13,K3,CO3*

**OR**

- b) With the aid of neat sketch explain the torque tube drive and also give its merits compared with Hotchkiss drive. *13,K3,CO3*

14. a) Describe the working of a power steering system with neat sketch. *13,K2,CO4*

**OR**

- b) Explain the construction and working principles of hydraulic brake with a neat sketch and also give its merits and demerits. *13,K2,CO4*

15. a) Discuss the operation of an LPG propelled vehicle with neat sketch. *13,K2,CO5*

**OR**

- b) Explain the working principle, merits and demerits of a fuel cell with schematic diagrams. *13,K2,CO5*

**PART - C (1 × 15 = 15 Marks)**

16. a) With the aid of a neat sketch, explain the working of a three way catalytic converter used in vehicles and also write down the various chemical reactions relevant to emission control in a three way catalytic converter. *15,K3,CO6*

**OR**

- b) Explain the performance, combustion and Emission characteristics of CI engines with alternate fuels. *15,K3,CO6*