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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| **Date:** 15 – 01- 2025 **Time:** 09:30 am – 12:30 pm |

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| --- | --- | --- |
| **School:** School of Engineering | **Program:** B. Tech – Mechanical Engineering | |
| **Course Code:** MEC3010 | **Course Name:** Automotive Engineering | |
| **Semester**: V | **Max Marks**: 100 | **Weightage**: 50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** | **CO5** |
| **Marks** | **4** | **42** | **44** | **48** | **42** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M** | | | | |
| **1** | Write down the three modes of combustion. | **2 Marks** | **L1** | **CO1** |
| **2** | What is the purpose of armature in an electronic ignition system? | **2 Marks** | **L2** | **CO1** |
| **3** | Differentiate two-stroke and four-stroke engines. | **2 Marks** | **L2** | **CO2** |
| **4** | What is the role of a transfer box in off-road vehicles? | **2 Marks** | **L1** | **CO3** |
| **5** | Mention two differences between overdrive and direct drive. | **2 Marks** | **L1** | **CO3** |
| **6** | Define the function of a clutch in an automobile. | **2 Marks** | **L2** | **CO4** |
| **7** | What is the primary purpose of a gearbox in a vehicle? | **2 Marks** | **L2** | **CO4** |
| **8** | List two differences between manual and automatic gearboxes. | **2 Marks** | **L1** | **CO4** |
| **9** | Briefly explain the role of a torque converter in an automatic transmission. | **2 Marks** | **L2** | **CO4** |
| **10** | What are the advantages of using biodiesel as an alternative fuel? | **2 Marks** | **L2** | **CO5** |

**Part B**

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| **Answer the Questions. Total Marks 80** | | | | | |
| **11.** | **a.** | Explain the types and construction of clutches used in automobiles. | **10 Marks** | **L2** | **CO2** |
|  | **b.** | Elaborate the various requirements of cooling systems used in automobiles. | **10 Marks** | **L2** | **CO2** |
| **or** | | | | | |
| **12.** | **a.** | Describe the overdrive mechanism and its advantages in improving vehicle performance. | **10**  **Marks** | **L2** | **CO2** |
|  | **b.** | With a suitable diagram, explain Common Rail Diesel Injection (CRDI) including the components involved | **10 Marks** | **L2** | **CO2** |
|  |  |  |  |  |  |
| **13.** | **a.** | Explain the construction and working of a manual gearbox with the help of a neat sketch. | **10 Marks** | **L2** | **CO3** |
|  | **b.** | Elaborate on various components of the Electronic Ignition System and explain how it works. | **10 Marks** | **L2** | **CO3** |
| **or** | | | | | |
| **14.** | **a.** | Explain the types and applications of vehicle frames and body constructions and also discuss the aerodynamic principles applied in modern vehicle designs. | **20 Marks** | **L2** | **CO3** |

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| **15.** | **a.** | Discuss the purpose and working of a transfer box in all-wheel-drive vehicles. | **20**  **Marks** | **L2** | **CO4** |
| **Or** | | | | | |
| **16.** | **a.** | Illustrate the construction and operation of a propeller shaft, highlighting the role of slip joints and universal joints. | **10**  **Marks** | **L2** | **CO4** |
|  | **b.** | Discuss the construction and functioning of a differential and rear axle in vehicles. | **10**  **Marks** | **L2** | **CO4** |

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| **17.** | **a.** | With the help of a diagram, explain the working of a fluid flywheel and its role in power transmission. | **20**  **Marks** | **L2** | **CO5** |
| **Or** | | | | | |
| **18.** | **a.** | Compare the environmental benefits of using biodiesel versus LPG in vehicles. | **20**  **Marks** | **L2** | **CO5** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***