**20ME702/PE**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | |
| **January, 2024** | **Mechanical Engineering** | | |
| **Seventh Semester** | **Automobile Engineering** | | |
| **Time:** Three Hours | | **Maximum: 7**0 Marks | |
| *Answer Question No.1 compulsorily.* | | | (1X14 = 14 Marks) |
| *Answer ONE question from each unit.* | | | (4X14=56 Marks) |
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| 1. | a) | Define an Automobile | CO1 | | L1 | 1M | |
|  | b) | Classify the IC engine with respect to type of ignition. | CO1 | | L2 | 1M | |
|  | c) | Why overheating and overcooling of I.C engine is harmful? | CO1 | | L1 | 1M | |
|  | d) | List the various components to be lubrication system in an engine | CO1 | | L1 | 1M | |
|  | e) | What is the function of spark plug in ignition system | CO2 | | L2 | 1M | |
|  | f) | How is reverse gear obtained in the normal type of gear box? | CO2 | | L2 | 1M | |
|  | g) | What is the function of a clutch? | CO2 | | L1 | 1M | |
|  | h) | List out the various functions of a propeller shaft. | CO2 | | L1 | 1M | |
|  | i) | Explain the term camber | CO3 | | L1 | 1M | |
|  | j) | What is the role of shock absorbers of an automobile? | CO3 | | L2 | 1M | |
|  | k) | Write the use of a brake in an Automobile | CO4 | | L1 | 1M | |
|  | l) | Define Electric vehicle | CO4 | | L1 | 1M | |
|  | m) | What is a hybrid vehicle? | CO4 | | L1 | 1M | |
|  | n) | Define a fuel cell | CO4 | | L1 | 1M | |
| **UNIT –I** | | | | | | | |
| 2. | a) | Explain the major systems of a four-wheeler automobile briefly. | | CO1 | L2 | | 7M |
|  | b) | Why an automobile needs a cooling system? Explain air cooling system | | CO1 | L2 | | 7M |
| **(OR)** | | | | | | | |
| 3. | a) | With a neat sketch, explain fuel supply system in SI Engine. | | CO1 | L2 | | 7M |
|  | b) | With neat sketches, explain the working of the mechanical fuel pump | | CO1 | L2 | | 7M |
| **UNIT –II** | | | | | | | |
| 4. | a) | Differentiate between the wet sump lubrication and dry sump lubrication. | | CO2 | L2 | | 7M |
|  | b) | What is the purpose of starter? Explain the working of a Bendex drive | | CO2 | L3 | | 7M |
| **(OR)** | | | | | | | |
| 5. | a) | What is the purpose of ignition system and What are the requirements of an ignition system for an I.C Engine? | | CO2 | L2 | | 7M |
|  | b) | Define ‘Chassis’. Write the requirements of a good chassis | | CO2 | L2 | | 7M |
| **UNIT –III** | | | | | | | |
| 6. | a) | With neat sketch explain the working of a single plate clutch | | CO3 | L3 | | 7M |
|  | b) | With a neat sketch explain Sliding mesh gear box. | | CO3 | L3 | | 7M |
| **(OR)** | | | | | | | |
| 7. | a) | Discuss in detail the construction and operation of the differential. | | CO3 | L2 | | 7M |
|  | b) | What is a suspension system in an automobile? Write the requirements of a good suspension system | | CO3 | L2 | | 7M |
| **UNIT –IV** | | | | | | | |
| 8. | a) | Draw a neat sketch of a steering system, mark all important parts on it and explain how the system works. | | CO4 | L2 | | 7M |
|  | b) | Explain the working of a hydraulic braking system with a suitable sketch | | CO4 | L2 | | 7M |
| **(OR)** | | | | | | | |
| 9. | a) | Explain different configurations of Electric vehicles | | CO4 | L2 | | 7M |
|  | b) | What is a fuel cell? Explain the working of a fuel cell | | CO4 | L3 | | 7M |