

**M.E. AUTOMOBILE ENGINEERING FIRST YEAR SECOND SEMESTER - 2024****Subject: VEHICLE DESIGN****Time: 3 hrs****Full Marks: 100****GROUP A**

- Q1. Answer **any 8** from the following: (Each question carry 1 mark) Marks:  $8 \times 1 = 8$
- |        |  |   |
|--------|--|---|
| (i)    | What are two types of vehicle suspensions?                     | 1 |
| (ii)   | Why are rings provided on piston?                              | 1 |
| (iii)  | Define lift Aerodynamic force.                                 | 1 |
| (iv)   | What do you mean by fluid flywheel?                            | 1 |
| (v)    | Write down the methods of operating automatic gearbox.         | 1 |
| (vi)   | What is meant by carburetion?                                  | 1 |
| (vii)  | How is power developed in automobiles?                         | 1 |
| (viii) | What is wheel balancing?                                       | 1 |
| (ix)   | Name the two types of propeller shafts.                        | 1 |
| (x)    | Classify automobiles with respect to the drive of the vehicle. | 1 |
- Q2. Answer **any 5** from the following: (Each question carry 3 marks) Marks:  $5 \times 3 = 15$
- |       |  |   |
|-------|--|---|
| (i)   | What are the functions of Turbo chargers?                                  | 3 |
| (ii)  | Explain the various forces acting on the body and its aerodynamic affects. | 3 |
| (iii) | Define the terms vaporization and atomization.                             | 3 |
| (iv)  | Explain the working of Disc brake system.                                  | 3 |
| (v)   | What are the types of frames?  | 3 |
| (vi)  | Define body and suspension of a vehicle.                                   | 3 |
| (vii) | What is the function of pressure plate in a clutch?                        | 3 |

**GROUP B**

- Answer **any 5** from the following: (Each question carry 7 marks) Marks:  $5 \times 7 = 35$
- |     |   |   |
|-----|---|---|
| Q3. | Explain the working principle of synchromesh gear box with neat sketch.                 | 7 |
| Q4. | What is a clutch? Explain the operation of centrifugal clutch.                          | 7 |
| Q5. | Explain with the help of simple diagram the different typas of stub axles.              | 7 |
| Q6. | Explain the working of a constant mesh gear box.  | 7 |
| Q7. | Explain the working of shock absorber with neat sketch.                                 | 7 |
| Q8. | What are the different types of cooling system and explain any one in detail.           | 7 |
| Q9. | Explain with a sketch the working of an electronic fuel injection system (any one type) | 7 |

**GROUP C**

- Answer **any 3** from the following: (Each question carry 14 mark) Marks:  $3 \times 14 = 42$
- |      |  |    |
|------|--|----|
| Q10. | Explain the construction and working of a differential unit with neat sketch.                | 14 |
| Q11. | Explain the working principles of hydraulic brake and Power-assisted Brake with neat sketch. | 14 |
| Q12. | With a neat sketch, explain the Electronically controlled diesel injection system.           | 14 |
| Q13. | Explain any five components of engine with neat sketch.                                      | 14 |
| Q14. | Explain briefly the various types of chassis construction with suitable diagrams.            | 14 |