

( 3 Hours )

[ Total Marks : 100

- N.B. :** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** questions from the **remaining** questions.  
 (3) **Figures** to the **right** indicate **full** marks.  
 (4) **Neat** sketches and precise answers carry **weightage**.



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|----|---|----|
| 1. | Explain in brief, the requirements of following for a road vehicle :-                       | 20 |
|    | (a) Transmission System   |    |
|    | (b) Braking System and Steering with Front Axle   |    |
|    | (c) Suspension System with Wheels and Tyres   |    |
|    | (d) Electrical System   |    |
|    | (e) Body Structural System.   |    |
| 2. | (a) Explain working of Single Plate Friction Clutch with clutch plate in detail.            | 12 |
|    | (b) Write on working of Shock Absorber.   | 8  |
| 3. | (a) Explain working of Air Brake System with backplate assembly in detail.                  | 12 |
|    | (b) Discuss in brief on various types of batteries. Explain working of Lead Acid Battery.   | 8  |
| 4. | (a) Discuss on advantages of Alloy Wheels and Tubeless Tyres.                               | 6  |
|    | (b) Explain applications of Leaf Springs (with and without Helper Spring) and Coil Springs. | 6  |
|    | (c) Write in brief on :-  |    |
|    | (i) Driver Seat Geometry  | 4  |
|    | (ii) Visibility and Blind Area.   | 4  |
| 5. | (a) Write on :-   |    |
|    | (i) Charging System   | 6  |
|    | (ii) Starting System.   | 6  |
|    | (b) Discuss on requirements of following :-   | 8  |
|    | (i) Flow Sensor   |    |
|    | (ii) Knock Sensor   |    |
|    | (iii) Oxygen Sensor   |    |
|    | (iv) Light Sensor.  |    |
| 6. | (a) Discuss about overall criteria for vehicle comparison.                                  | 6  |
|    | (b) Explain differences in open, semi-integral and integral structures.                     | 6  |
|    | (c) Discuss on basic four types of "Final Drives".  | 8  |
| 7. | (a) Explain working of "ECM".   | 12 |
|    | (b) Explain following terms :-  | 8  |
|    | (i) Camber  |    |
|    | (ii) Kingpin Inclination  |    |
|    | (iii) Caster  |    |
|    | (iv) Toe-in, Toe-out.   |    |