

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE- SEMESTER-V (NEW) EXAMINATION – WINTER 2020****Subject Code:2150202****Date:03/02/2021****Subject Name:Automobile Systems****Time:10:30 AM TO 12:30 PM****Total Marks: 56****Instructions:**

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|------------|-----|--|----------|
| <b>Q.1</b> | (a) | Discuss the function universal joint in power transmission.  | <b>3</b> |
|            | (b) | How an automobile is classified on basis of (a) Transmission (b) Wheel drive.  | <b>4</b> |
|            | (c) | What is the importance of differential in vehicle? Explain its working and construction with diagram.                                      | <b>7</b> |
| <b>Q.2</b> | (a) | List different types of lining materials used in brakes.   | <b>3</b> |
|            | (b) | Explain the following terms: (i) Caster (ii) Camber (iii) Toe in & Toe out (iv) Slip angle   | <b>4</b> |
|            | (c) | Explain hydraulic braking system. Explain construction and working of Master cylinder with neat sketch.                                    | <b>7</b> |
| <b>Q.3</b> | (a) | Write the advantages of fluid flywheel.  | <b>3</b> |
|            | (b) | Explain functions of automobile frame. Give comparison of conventional frame and frameless construction.                                   | <b>4</b> |
|            | (c) | Explain important of steering gearbox. Explain any two types of steering gear box with neat sketch.  | <b>7</b> |
| <b>Q.4</b> | (a) | “ In Automobile front axle, generally I section is provided in middle and elliptical Section provided at the end” Justify the statement.   | <b>3</b> |
|            | (b) | Explain semi centrifugal clutch.<br>Explain  | <b>4</b> |
|            | (c) | 1.Wishbone independent suspension<br>2.Mac Pherson strut independent suspension  | <b>7</b> |
| <b>Q.5</b> | (a) | What is the requirement of propeller shaft ? Explain with neat sketch.   | <b>3</b> |
|            | (b) | Explain the difference between radial ply and bias ply tires.<br>A four wheel drive passenger car moving up with high speed on an inclined | <b>4</b> |
|            | (c) | road surface. Explain the types of road loads acting on the vehicle with suitable diagram.   | <b>7</b> |
| <b>Q.6</b> | (a) | Define the following terms:<br>(i) Air resistance (ii) Gradiability (iii) Traction and Tractive effort.                                    | <b>3</b> |
|            | (b) | Compare front and rear mounting engine.  | <b>4</b> |

- (c) What is Continuous variable transmission in automobile? Explain working principal of continuous variable transmission. 7
- Q.7** (a) Explain the following terms in details. 3  
(i) Over inflation (ii) Air bleeding (iii) Under inflation.  
(b) Explain Ackermann steering in detail with neat sketch. 4  
(c) Explain different types of material used in automobile body construction. 7
- Q.8** (a) Explain with neat sketch vehicle layout for front engine front wheel drive. 3  
(b) Explain the types of belts in brief. 4  
(c) Explain hydro-elastic suspension. 7

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