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Roll No. : .....

**337731(37)**

**B. E. (Seventh Semester) Examination,  
Nov.-Dec. 2021**

**(New Scheme)**

**(Mech., Production Engg. Branch)**

**AUTOMOBILE ENGINEERING**

***Time Allowed : Three hours***

***Maximum Marks : 80***

***Minimum Pass Marks : 28***

***Note : Attempt all questions. Part (a) of each question is compulsory and attempt any two from parts (b), (c) and (d).***

**Unit-I**

1. (a) What are the objects of Suspension? 2
- (b) What are the different types of Springs? Explain leaf spring. 7

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- (c) What are the advantages of Rubber Spring? Explain in brief any two types of rubber spring. 7
- (d) What are the advantages of Independent Suspension over the rigid axle type suspension. Also discuss its characteristics. 7

### Unit-II

2. (a) Enlist main components of friction clutch. 2
- (b) The engine of a car employing a single plate friction clutch develops maximum torque of 150 Nm. External diameter of the clutch plate is 1.2 times its internal diameter. Determine the dimensions of clutch plate & the axial force provided by the springs. The maximum allowable pressure intensity for the clutch facings is 100 KPa and coefficient of friction is 0.3. Assume uniform wear. 7
- (c) Where and why do we use multiple clutches? Explain the constructional features and working of multiple dry clutch. 7

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- (d) Explain by means of a neat sketch the construction of a flural flywheel. 7

### Unit-III

3. (a) Draw tractive effort curve in 1<sup>st</sup>, 2<sup>nd</sup> and top gears respectively. 2
- (b) Describe the working of a synchronous gear box with the help of neat sketch. What are the merits compared to sliding mesh a constant mesh types? 7
- (c) Write a brief note explaining how the lubrication of a automative gear box is done. 7
- (d) Describe in detail the purpose and procedure of vacuum and cylinder compression tests for auto engines. 7

### Unit-IV

4. (a) What is Stub Axle? 2
- (b) Describe the operation of limited-slip differential. 7
- (c) Discuss in detail various factors affecting tyre life. 7

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- (d) Draw a simple diagram to show layout of a hydraulically operated four wheel brake system and explain its working in detail. 7

### Unit-V

5. (a) What is the condition of true rolling? 2
- (b) Explain the terms : Camber, Castor, Steering axis inclination and toe-in. What are the effects of each on the steering characteristics of a vehicle. 7
- (c) What do you understand from the terms : Oversteer, Understeer, Cornering power and Slip angle. 7
- (d) Explain in detail how would you perform specific gravity test for battery? 7