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Roll No. :

337731(37)

**B. E. (Seventh Semester) Examination,
April-May 2021**

(New Scheme)

(Mech. 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). Answer briefly and to the point. Draw neat sketches.

Unit-I

1. (a) Name the major component of an automobile. 2
- (b) Draw a neat sketch of a hydraulic shock absorber and explain its construction and working. 7

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- (c) Why is the front end of front semi elliptic leaf spring is generally shackled and rear end is pivoted? 7
- (d) Why shock absorber is used in suspension system? Explain construction and working of telescopic type shock absorber. 7

Unit-II

2. (a) What is the function of a clutch? 2
- (b) A multiplate clutch is to be designed for a motor cycle whose engine develops maximum torque of 13 Nm at 3500 r.p.m. the external diameter of the clutch facing is limited to 100 mm and the inner diameter may be assumed to be 0.2 times the external dia. The maximum intensity of pressure may be taken as 80 kPa and $\mu = 0.3$. Calculate the number of plates. 7
- (c) Draw neat sketch of fluid flywheel. State the principle and construction of fluid flywheel. 7
- (d) With a neat sketch explain the constructional details and the function of each component of a single plate clutch. 7

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Unit-III

3. (a) Write the name of resistance to motion of a vehicle. 2
- (b) With suitable figure write the construction and working of torque converter. 7
- (c) Sketch and explain the construction of a sliding mesh gear box. Show power flow path in top gear, second gear and reverse gear. 7
- (d) What is the function of a over drive system in automobile? Explain its mechanism with the help of sketch. 7

Unit-IV

4. (a) What is function of a differential in a motor vehicle? 2
- (b) Briefly explain Hotchkiss drive and Torque tube drive giving neat sketch. 7
- (c) What are the merits of a disc brake? Explain the construction and working of a disc brake. 7

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(d) What is the necessity of universal joint, slip (sliding) joint and a differential in a motor vehicle. 7

Unit-V

5. (a) Define Castor Angle. 2

(b) Draw the simple wiring diagram of the electrical system of an automobile. List the main components of the electrical system. 7

(c) Write the principle and working of power steering. 7

(d) Write notes on any **three** of the following : 7

(i) Camber

(ii) King pin inclination

(iii) Toe in and Toe out

(iv) Slip angle