**Roll No:** | | | | | | | | | | | | | |

## B. TECH.
## (SEM-VII) THEORY EXAMINATION 2020-21
## AUTOMOBILE ENGINEERING

*Time: 3 Hours*                                                      *Total Marks: 70*

**Note:** **1.** Attempt all Sections. If require any missing data; then choose suitably.

### SECTION A

1. **Attempt *all* questions in brief.**                             **2 x 7 = 14**
   a. State the basis on which automobile are classified.
   b. What is chassis? How is its design related to vehicle aerodynamics?
   c. How are automobiles streamlined based on transmission?
   d. What are the stresses to which the frame members are subjected to?
   e. Define the term 'double declutching' used in sliding mesh gear box.
   f. Define Cornering force and cornering power.,
   g. Why are fuel cells not preferred for automobiles now?

### SECTION B

2. **Attempt any *three* of the following:**                         **7 x 3 = 21**
   a. A single cylinder engine running at 180 rpm develops a torque of 8 Nm. The indicated power of the engine 1.8 kW. Find the loss due to friction power as the percentage of brake power.
   b. Sketch and explain various steering geometries.
   c. Explain the various sensors used in an electronic engine management system and their functions.
   d. Explain the working of lighting system of an automotive with neat sketch.
   e. Explain in detail about the engine emission control by three-way catalytic converter system.

### SECTION C

3. **Attempt any *one* part of the following:**                      **7 x 1 = 7**
   (a) A car moves along a horizontal road against a resistance of 400 N. What is the greatest speed (in kph) the car can reach if the engine has a maximum power of 16 kW?
   (b) Compute the reaction forces, maximum acceleration and tractive effort for vehicle driving on front wheel drive, rear wheel drive and all-wheel drive.

4. **Attempt any *one* part of the following:**                      **7 x 1 = 7**
   (a) Explain with a simple sketch, working of centrifugal type of clutch and why free play should be provided for clutch.
   (b) What are camber and castor angles, what are its significance in steering geometry.

5. **Attempt any *one* part of the following:**                      **7 x 1 = 7**
   (a) Explain with a schematic diagram, working of rigid axle front wheel suspension system.
   (b) Explain with a simple sketch, working of power brakes in a commercial automobile.

6. **Attempt any *one* part of the following:**                      **7 x 1 = 7**
   (a) What are the types of electronic ignition system? Describe any one of them clearly stating its advantages over conventional ignition system.
   (b) What is the difference between fuel injection engine and carbureted engines? Explain in detail.

7. **Attempt any *one* part of the following:**                      **7 x 1 = 7**
   (a) Briefly explain the mechanism of formation of pollutants in automobile exhaust.
   (b) Explain with neat sketch the working of fuel cell & also its advantages & disadvantages.