PAPER ID-410465

Roll No:

B.TECH
(SEM VII) THEORY EXAMINATION 2021-22
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. Define gear ratio.
   b. Discuss double declutching.
   c. Discuss constant velocity joint.
   d. List out requirement of good suspension system.
   e. List out the types of Chassis frame.
   f. Define the role of ignition coil in ignition system.
   g. Discuss the quality of good lubricant.

SECTION B

2. **Attempt any *three* of the following:**   7 x 3 = 21
   a. Make a comparison between sliding mesh and constant mesh gear box.
   b. Briefly explain the variation of resistance to the vehicle motion at the various speeds and total resistance to the vehicle motion.
   c. Explain the Construction and working of Air brakes.
   d. What is meant by Steering Geometry and explain with neat sketches?
   e. Explain the construction detail of Fuel supply system used in CI Engine.
   f. Discuss Alternative fuels.

SECTION C

3. **Attempt any *one* part of the following:**   7 x 1 = 7
   (a) For a motor car weighing 13500 N, the air resistance in Newton is given by 0.002 AV2 where A is the frontal area in m2 and V is the velocity in Km/hr. The rolling resistance equals one hundredth the weight of vehicle. Taking car speed 56Km/hr and car frontal area 2.25 m2, determine the power required to propel the vehicle on the level road. Also determine the maximum gradient which the vehicle can climb if the tractive effort available at the wheel is estimated to be 1860 N.
   (b) Illustrate Piston and their types with diagram.

4. **Attempt any *one* part of the following:**   7 x 1 = 7
   (a) A simple gear train consists of two gears only, each gear mounted on separate parallel shafts. The numbers of teeth on the driving and driven gears are 28 and 70 respectively. If the driving gear turns 1200 revolutions per minute, determine:
       (i) Speed ratio and train value of the gear train,
       (ii) Speed of the driven gear, and Direction of rotation of the driven gear if the driving gear rotates clockwise.
   (b) Explain differential gear mechanism of rear axle with a neat sketch.

5. **Attempt any *one* part of the following:**   7 x 1 = 7
   (a) Explain the working and construction detail of ABS.
   (b) Explain telescopic shock absorber with diagram.

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6.   **Attempt any *one* part of the following:**   **7 x 1 = 7**
   (a)   Explain the construction detail of Fuel supply system used in SI Engine. Also Explain and draw a neat line diagram of MPFI in SI engines.
   (b)   Explain the requirement and functioning of an ignition system in an automobile? Write the working steps of Battery Ignition System.

7.   **Attempt any *one* part of the following:**   **7 x 1 = 7**
   (a)   Why maintenance is required in automobile? Explain different types of maintenance used in automobile.
   (b)   Explain the operating principle of Fuel Cell with line diagram.