

B. TECH.
(SEM VII) THEORY EXAMINATION 2017-18
AUTOMOBILE ENGINEERING

Time: 3 Hours

Total Marks: 100

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

SECTION A

- 1. Attempt all questions in brief. 2 x10 = 20**
- a. Classify an automobile on the basis of transmission system and wheel drive system.
 - b. State the main functions of frame.
 - c. Why a clutch is necessary in the transmission system of an automobile?
 - d. What is meant by double declutching?
 - e. What is a constant velocity joint?
 - f. Explain camber and its effect on tire wear.
 - g. Define bouncing and rolling.
 - h. What is meant by fading of vehicle brakes?
 - i. Enumerate the various requirements of a good ignition system.
 - j. Draw the layout of the air-conditioning system for a car.

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. State the difference between dry and wet types of friction clutch. List the properties of a good clutch lining.
 - b. Make a comparison between sliding mesh and constant mesh gear box.
 - c. State and explain the principle of Ackerman steering mechanism.
 - d. Give a brief description of torsion bar and stabilizer bar.
 - e. Name the pollutants emitted by gasoline engines and petrol engines into the atmosphere.

SECTION C

- 3. Attempt any one part of the following: 10 x 1=10**
- a. It is possible to make a faster climb in low gear on certain gradients than in top gear. Comment on the validity of this statement.
 - b. What are synchronizers? Point out their utility in transmission.
- 4. Attempt any one part of the following: 10 x 1=10**
- a. What is meant by cornering force? How it is affected by slip angle, inflation pressure and tire load?
 - b. State the function of front axle. Sketch a typical front axle and give brief description of its constructional features.
- 5. Attempt any one part of the following: 10 x 1=10**
- a. What is meant by independent suspension system? How it is achieved in front and rear wheel?
 - b. Compare the constructional and operational aspects of disc and drum brakes. Which one is preferred and why?
- 6. Attempt any one part of the following: 10 x 1=10**
- a. Draw the schematic arrangements for the common rail and individual pump injection systems. Point out the relative merits and demerits of these systems.

- b. Explain, with a neat sketch, the working of a simple plain tube carburetor. Mention the limitations of this carburetor.

7. Attempt any *one* part of the following:

10 x 1=10

- a. Mention a sectioned sketch to show the main features of a spark plug in common use. Name the main parts and state the materials from which they are made.
- b. State and explain the construction and working of 3-way catalytic converter.