Sub Code: RAU071

Paper Id: 147722 Roll No: | | | | | | | | | | | | |

**B. TECH.**
**(SEM VII) THEORY EXAMINATION 2019-20**
**ADVANCED AUTOMOBILE TECHNOLOGIES**

***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. What will the automotive industry look like in the future?
b. How are Fuel Cell Cars different from Electric Vehicles?
c. What is the future of the diesel engine car?
d. What is drive-by-wire technology?
e. What are the hurdles in implementing 42-volt technology for automobiles?
f. In what ways are hybrid cars superior to regular cars?
g. What are all the sensors used in a self-driving car?

**SECTION B**

**2. Attempt any *three* of the following: 7 x 3 = 21**

a. What technologies will become relevant for the automotive industry in future? Explain the Industry 4.0 implementation steps in automotive industries.
b. Why is there direct fuel injection in diesel engines? Explain different components of direct fuel injection system in details.
c. Explain the following with reference to 42 Volt System:
   (i) Power system
   (ii) Power peering
   (iii) Power brakes
   (iv) Power windows
   (v) Automated systems
d. What is the difference between hybrid cars and electric cars? Why are hybrid cars are more costly?
e. Write shot note on use of actuators in an automobile environment.

**SECTION C**

**3. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What is the future of a hydrogen fuel cell on cars and transportation? At what point will hydrogen fuel cells be practical to use in transportation?
(b) What is Electric propulsion with cables? Give the advantages and disadvantages Hydrogen engines.

**4. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What are the causes of pollution emission in diesel engine? What measures can be taken to reduce pollution from diesel engines?
(b) What are the new trends in IC engine? What do you know about CDI, camless engines like GDI, VTEC?

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**5. Attempt any *one* part of the following: 7 x 1 = 7**

(a) Explain computer controlled front collision prevention with neat diagram.

(b) Explain the devices used in Computer Control for pollution and noise control and for fuel economy for an automotive vehicle.

**6. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What's the future of energy storage and how does it impact renewables? What are some new and practicable energy storage methods?

(b) What is the difference between a capacitor and a battery? What are the advantages and disadvantages of using batteries vs. capacitors in terms of energy storage?

**7. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What is Electrical assisted steering? Explain Electrical assisted steering with neat sketch.

(b) What are the functions of suspension system? Explain Semi-active and fully-active suspension system with neat sketches.