

Code No: R1642241

**R16**

**Set No. 1**

**IV B.Tech II Semester Regular Examinations, September - 2020**  
**AUTOMOTIVE CONTROL SYSTEMS**  
**(Automobile Engineering)**

**Time: 3 hours**

**Max. Marks: 70**

*Question paper consists of Part-A and Part-B*  
*Answer ALL sub questions from Part-A*  
*Answer any FOUR questions from Part-B*

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**PART-A (14 Marks)**

1. a) Define lean mixture and rich mixture. [2]
- b) Write a short note on multiple direct injection in diesel engines. [2]
- c) What is a catalytic convertor? Write its advantages. [3]
- d) What is active and passive diagnosis? [2]
- e) Define wheel slip and tire side slip angle. [2]
- f) Write the applications of mechatronic systems. [3]

**PART-B (4x14 = 56 Marks)**

2. a) What is effective work? Why is the effective work delivered by the engine is much lower than the thermal energy caused by combustion? [7]
- b) What are the major functions of fuel control system? Discuss the parameters that effect the total amount of fuel injected. [7]
3. a) With a help of neat diagram, explain the process of in-cylinder injection in internal combustion engine. [7]
- b) Describe briefly the mechanism of fuel evaporation processes in modern diesel engines. [7]
4. a) Explain in detail about Engine model for Lambda control. [7]
- b) Discuss Knocking in SI engine. Explain adaptive knock control. [7]
5. a) What is the importance of Diagnosis in automotive engines? Explain the characteristics of Modal based diagnosis. [7]
- b) Explain the following  
i) Model Identification      ii) Residual evaluation. [7]
6. a) Explain how to evaluate 'road-gradient' by using 'acceleration and wheel speed' method. [7]
- b) Explain in detail Hybrid drive Model. [7]
7. a) With a neat sketch explain the working of hydraulic actuation system. Write its advantages. [7]
- b) Explain the working of LVDT. Write its advantages and applications. [7]

