

Code No: **R42241**

**R10**

**Set No. 1**

**IV B.Tech II Semester Supplementary Examinations, July/Aug – 2015**

**AUTOMOTIVE CONTROL SYSTEMS**

**(Automobile Engineering)**

**Time: 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions**

**All Questions carry equal marks**

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- 1 a) Describe the principle of operation of a compression –ignition engine. With the help of ‘p-v’ diagram, [8]  
b) Explain the Potential of different Fuels and Propulsion systems. [7]
- 2 a) Draw a cross-sectional view of intake manifold, and write the equation of ‘change in internal energy of the air-mass’ into the intake manifold, in terms in-coming and out-going energy flows. [8]  
b) What is the effect of fuel- temperature on inflammation delay? Explain. [7]
- 3 a) What do you understand about ‘charge-exchange’ in IC engines? Write the mathematical expression. [8]  
b) What is the importance of fuel evaporation? Explain briefly. [7]
- 4 a) What do you understand about ‘adaptive knock control’? Explain briefly. [7]  
b) Explain the Stoichiometric operation of spark-ignition engine? [8]
- 5 a) Explain briefly the ‘crankshaft moment of inertia’ method of misfire detection [8]  
b) What is the purpose of residual evaluation? Explain. [7]
- 6 a) Explain briefly, the stationery gear- shift experiments. [7]  
b) Explain the fuel-injection strategy used for speed control and write its advantages. [8]
- 7 a) What do you understand about ‘yaw dynamics and its vehicle control system’? [7]  
b) Draw the pattern of ABS cycle signals of wheel speed and cut-out of wheel acceleration and explain the detection of ABS cycle. [8]
- 8 a) What is wind-strength? What is the significance of wind-strength? Explain. [8]  
b) What do you understand about hybrid-driver model? Explain. [7]

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**Set No. 2**

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**AUTOMOTIVE CONTROL SYSTEMS**

**(Automobile Engineering)**

**Time : 3 hours**

**Max. Marks: 75**

**Answer any FIVE Questions**

**All Questions carry equal marks**

**\*\*\*\*\***

- 1 a) How do you classify automotive engines based on fuel usage? What are the advantages? [8]
- b) With a line diagram, describe the working principle of Stirling engine. [7]
- 2 a) With a simple diagram, briefly explain the process of manifold-injection in IC engines. [8]
- b) What is the importance of air-fuel ratio? [7]
- 3 a) Draw the schematic structure of a fuel injector and express the 'flow-rate of injected fuel-mass with respect to crankshaft angle' [8]
- b) Explain briefly the 'zero-dimensional modeling' of cylinder dynamics [7]
- 4 a) What are the advantages and disadvantages of 'combustion pressure sensor'? [7]
- b) Draw the block diagram of a lambda-controlled spark-ignition engine, and explain the Stoichiometric operation of spark-ignition engine? [8]
- 5 a) What are the principles of model-based diagnosis? Explain briefly. [7]
- b) What is the necessity of 'on-board diagnosis of automotive engine? Explain briefly [8]
- 6 a) Derive the following basic driveline equations of 'front-engine rear-wheel' drive [8]
- b) Write the difference between 'drive-line speed control' and 'drive-line torque control'? [8]
- 7 a) How do you estimate the 'road-gradient' by using 'model based road gradient observation (Luenberger-observer)' method? Explain [8]
- b) What is road gradient? Explain briefly and its importance [7]
- 8 a) What do you understand about PID driver model? Explain briefly. [7]
- b) What are the different types of road models and Requirements of the Road Models? Explain. [8]