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10AU74

**Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**Automotive Air Pollution and Control**

Time: 3 hrs.

Max. Marks:100

**Note:** Answer any FIVE full questions, selecting atleast TWO questions from each part.

**PART – A**

- 1 a. Explain the following European cycles with suitable graphs : (10 Marks)  
 i) ECE Urban cycle      ii) Two – wheel cycles.
- b. Explain the influence of actual traffic conditions and maintenance of vehicles on Exhaust Emissions. (10 Marks)
- 2 a. Explain the formation of unburnt Hydrocarbon in spark ignition engine and briefly discuss about the factors influencing UBHC formation. (10 Marks)
- b. Explain the mechanism of oxides of Nitrogen formation in Engines. (10 Marks)
- 3 a. Explain any five different measures in Engines to control Diesel Emissions. (10 Marks)
- b. Write a note on the following :  
 i) Fuel Additives to reduce smoke and particulates.  
 ii) Positive crank case ventilation system. (10 Marks)
- 4 a. Explain the effect of following fuel properties in SI engine on Emissions : (12 Marks)  
 i) Additives    ii) Octane number    iii) Volatility    iv) Olefinics and Aromatics content.
- b. Explain the importance of High – content oxygenated compounds in SI Engines and Diesel Engines. (08 Marks)

**PART – B**

- 5 a. Explain the following with respect to Catalytic Mechanism : (12 Marks)  
 i) Co – oxidation mechanism      ii) Nitrogen oxide reduction mechanism  
 iii) Dual catalysis      iv) Three – way catalysis.
- b. Write a note on following :  
 i) NO<sub>x</sub> treatment in diesel engines      ii) Diesel Trap oxidizers. (08 Marks)
- 6 a. What are the harmful effects of the following on human beings : (10 Marks)  
 i) Sulphur dioxide      ii) Carbon monoxide      iii) oxides of Nitrogen  
 iv) Insecticides      v) Hydro carbons.
- b. Explain the effects of various Air Pollutants on plants. (10 Marks)
- 7 a. Explain the particulate sampling methods using Sedimentation and Filtration type. (10 Marks)
- b. Briefly explain the following :  
 i) Electro static precipitation      ii) Thermal precipitation. (10 Marks)
- 8 a. With a neat sketch, explain Orsat Apparatus used for Exhaust Gas Analysis. (10 Marks)
- b. Explain the working principle of NDIR Analyzer, with a neat sketch. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.