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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_x 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)

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.