



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Eighth Semester, B.E. - Automobile Engineering

Semester End Examination; May/ June - 2019

Automotive Air Pollution and Control

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Explain the formation of NO_x with chemical reaction in C.I engine and also name the engine variables influences the formation of NO_x with brief explanation. 10
- b. What is UBHC? Determine the reasons both in SI and CI engines. 10
- 2 a. Analyze the effect of Air fuel ratio, Burnt gases, Engine speed and Ignition timing on the formation of Nitrogen oxides. 10
- b. Infer the soot formation mechanisms and suggest some important reasons. 10

UNIT - II

- 3 a. Why the lean burn SI engine is recommended to achieve reduced emission? 6
- b. Suggest some measures to control the emission of pollutants in SI and CI engines. 6
- c. With neat sketch, explain the EGR system. 8
- 4 a. Explain with a neat sketch the construction, signification and working of positive crankcase ventilation system. 10
- b. Discuss the effect of combustion chamber shape and fuel injection variables on emission. 10

UNIT - III

- 5 a. Discuss the effect of the following gasoline fuel properties on emission :
- i) Octane number ii) Aromatic contents 10
- iii) Additives iv) Distillation interval
- b. Discuss the harmful effects of the following on human health : 10
- i) Lead ii) NO_x iii) CO iv) Sulfur dioxide
- 6 a. Discuss any five properties of diesel fuel, which influences the emission from CI engine. 10
- b. List out the different gas sampling methods and explain any two in detail. 10

UNIT - IV

- 7 a. Explain the construction and working of NDIR analyser with a neat sketch. 10
- b. Briefly explain the test cycle for light, medium and heavy duty vehicles. 10
- 8 a. Explain the gas analysis method, with the help of Orsat gas analyzer. 10
- b. Explain the working of following smoke meters :
- i) Filter type 10
- ii) Bosch type

UNIT - V

- 9 a. What is post combustion treatment? What is the necessity? 6
- b. Write a short note on catalyst poisoning and thermal reactor. 6
- c. With sketch, explain the working of wire mesh particulate trap and oxidizer. 8
- 10 a. What are the exhaust gas contents before the treatment? 4
- b. With sketch, explain the working of ceramic honeycomb (monolith) type catalytic converter. 8
- c. With schematic diagram, explain the working of thermal reactor for HC and CO oxidation. 8

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