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Sixth Semester B.E. Degree Examination, Dec.2024/Jan.2025 Automotive Pollution and Control

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain the following European cycles with suitable graphs:
 - i) ECE urban cycle ii) Two-wheel cycles. (10 Marks)
- b. Explain the influence of actual traffic conditions and maintenance of vehicles on exhaust emissions. (10 Marks)

OR

- 2 a. i) Define air pollution and briefly explain various of air pollution. (06 Marks)
 ii) What are the effect of photo chemical smog? (04 Marks)
- b. Explain the effect of air pollution on human health along with a neat sketch. (10 Marks)

Module-2

- 3 a. Explain the mechanism of oxides of nitrogen formation in Engine. (10 Marks)
- b. Write about the different mechanism of NO_x formation. (10 Marks)

OR

- 4 a. Explain the formation of unburnt hydro carbon in spark ignition engine and briefly discuss about the factor influencing UBHC formation. (10 Marks)
- b. Explain the flame quenching and oxidation fundamentals process. (10 Marks)

Module-3

- 5 a. What is meant by evaporative emission control? Give an example for it. (10 Marks)
- b. What is meant by a fuel cell? How its related to automotive pollution. (10 Marks)

OR

- 6 a. What is meant by a lubricants emission? How its related to automotive pollution. (12 Marks)
- b. Write a note on the following:
 - i) Catalyst poisoning. (08 Marks)

Module-4

- 7 a. Explain the following with respect to catalytic mechanism:
 - i) Co-oxidation mechanism
 - ii) Dual catalysis
 - iii) Nitrogen oxide reduction mechanism
 - iv) Three way catalysis. (12 Marks)
- b. Write a note on following:
 - i) NO_x treatment in diesel engine.
 - ii) Diesel trap oxidizers. (08 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.

OR

- 8 a. Explain the following with respect to catalytic mechanism:
i) Installation of catalyst in exhaust line. (10 Marks)
ii) Diesel Trap oxidizer. (10 Marks)
- b. Write a note on following:
i) Particulate traps (10 Marks)
ii) Catalyst light-off. (10 Marks)

Module-5

- 9 a. Explain the particulate sampling methods, using sedimentation and filtration type. (10 Marks)
- b. Briefly explain the following:
i) Electro static precipitation (10 Marks)
ii) Thermal precipitation. (10 Marks)

OR

- 10 a. With a neat sketch, explain Orsat-Apparatus used for exhaust gas analysis. (10 Marks)
- b. Explain the working principle of NDIR analyzer with neat sketch. (10 Marks)

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