

CBCS SCHEME

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18AU643

Sixth Semester B.E. Degree Examination, Dec.2023/Jan.2024 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 regulatory test procedure of European cycle Emission. (10 Marks)
b. Discuss the harmful effects of the following on Human health : (10 Marks)
i) Lead ii) Nox iii) CO and iv) Particulate .

OR

- 2 a. Explain the influence of actual traffic conditions and Vehicle maintenance on the exhaust emission. (10 Marks)
b. What is Pollution? What are the major pollutants and their effects on : (10 Marks)
i) Human life ii) Animals iii) Plant life iv) Environment.

Module-2

- 3 a. Explain the formation of Nitrogen oxides that take place during combustion. Also analyze the effect of ignition timing and humidity on the formation of Nitrogen oxides. (08 Marks)
b. Clarify the flame quenching effect on hydrocarbon emissions with the help of suitable sketch. (08 Marks)
c. Infer the root formation mechanisms and suggest some important reasons. (04 Marks)

OR

- 4 a. What is UBHC? Determine the reasons both in SI and CI engines. (10 Marks)
b. Analyze the effect of low and high content oxygenated compounds on the emissions in case of SI engines. (10 Marks)

Module-3

- 5 a. Illustrate the impact of following factors to control diesel engine emissions : (06 Marks)
i) Advance injection ii) Turbulence iii) Temperature.
b. What is meant by lean burn strategy and how will it help to avoid the pollution. (06 Marks)
c. Explain the effects of following on pollution : i) Volatility of fuels (08 Marks)
ii) Alternative fuels iii) Mis - fueling iv) Carbon content.

OR

- 6 a. Explain the exhaust gas recirculation system with supporting diagram. (08 Marks)
b. Discuss the effect of Compression ratio , Variable swept volume , Equivalence ratio and Combustion chamber shape on Emission in SI Engine. (06 Marks)
c. Discuss the effect of the following petrol fuel properties on emission : (06 Marks)
i) Aromatic contents ii) Viscosity and density iii) Octane number.

Module-4

- 7 a. What is Port Combustion treatment? What is the necessity? Write a note on available options for exhaust treatment. (08 Marks)

- b. With schematic diagram, explain the working of thermal reaction for HC and CO oxidation. (08 Marks)
- c. Mention the merits and demerits of Catalytic converter. (04 Marks)

OR

- 8 a. With neat sketch, explain the working of Ceramic Honeycomb (Monolith) type catalytic converter. (10 Marks)
- b. Briefly explain the diesel trap oxidizer and selective catalytic reduction with suitable sketch. (10 Marks)

Module-5

- 9 a. Differentiate the following methods of sampling :
i) Volumetric method ii) Gravimetric method. (10 Marks)
- b. With the help of a neat sketch, explain how FID is used for hydrocarbon analysis. (10 Marks)

OR

- 10 a. Explain Sedimentation technique for collection of particulate matter. Justify how far it is effective than other methods. (10 Marks)
- b. Discuss Comprehensively the principles used in the measurement of diesel smoke. (10 Marks)
