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 :
i) Lead ii) Nox iii) CO and iv) Particulate . **(10 Marks)**

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 :
i) Human life ii) Animals iii) Plant life iv) Environment. **(10 Marks)**

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 care of SI engines. **(10 Marks)**

Module-3

5 a. Illustrate the impact of following factors to control diesel engine emissions :
i) Advance injection ii) Turbulence iii) Temperature. **(06 Marks)**

b. What is meant by lean burn strategy and how will it helpful to avoid the pollution. **(06 Marks)**

c. Explain the effects of following on pollution : i) Volatility of fuels
ii) Alternative fuels iii) Mis – fueling iv) Carbon content. **(08 Marks)**

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 :
i) Aromatic contents ii) Viscosity and density iii) Octane number. **(06 Marks)**

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)**

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