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10AU74

Seventh Semester B.E. Degree Examination, June/July 2017
Automotive Air Pollution and Control

Time: 3 hrs.

Max. Marks: 100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. List the different pollutants and explain respective sources in automobiles. (10 Marks)
b. Explain the influence of actual Traffic conditions and vehicle maintenance on emissions. (10 Marks)
- 2 a. Explain the formation of Nitric oxide (NO) in S.I. engines. Also explain the effect of burnt gases and ignition timing on NO formation. (10 Marks)
b. Explain the formation of unburnt hydrocarbons in diesel engines and also the effect of fuel air ratio and flame quenching. (10 Marks)
- 3 a. Explain with a neat sketch, Exhaust Gas Recirculation (EGR) system to control NO_x emissions. (08 Marks)
b. Explain engine design modifications to reduce the pollutants from S.I engines. (06 Marks)
c. Explain positive crankcase ventilation system with a neat sketch. (06 Marks)
- 4 a. Discuss any five properties of petrol which influence the exhaust emissions. (10 Marks)
b. Explain the effects of fuel density, cetane number and additives on emissions from a diesel engine. (06 Marks)
c. Discuss the effect of lubricants on emissions. (04 Marks)

PART – B

- 5 a. Explain thermal reactor for oxidation of CO and HC with a neat sketch. (08 Marks)
b. Discuss various techniques of NO_x treatment in diesel engines. (06 Marks)
c. Explain monolithic traps for the filtration of particulates with a neat sketch. (06 Marks)
- 6 a. Explain the effects of following pollutants on human health. (08 Marks)
i) Carbon monoxide ii) Oxides of nitrogen iii) Sulphur dioxide iv) Lead.
b. Explain the effects of arsenic poisoning on farm animals. (06 Marks)
c. Explain the effects of sulphur dioxide and hydrogen fluorides on plants. (06 Marks)
- 7 a. Explain preliminary considerations and stages of sampling. (08 Marks)
b. Explain sedimentation technique for the collection of particulate matter. (06 Marks)
c. Explain electrostatic precipitation in brief. (06 Marks)
- 8 a. Explain with a neat sketch the working of flame ionization detector. (06 Marks)
b. Explain orsat apparatus for the exhaust gas analysis with a neat sketch. (08 Marks)
c. Explain Bosch Smokemeter with a neat sketch. (06 Marks)

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1. Do not write anything on the remaining blank pages.
2. Any scribbles or marks made on the remaining blank pages will be treated as an attempt to reveal the answer and will be penalized accordingly.