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10AU74

Seventh Semester B.E. Degree Examination, Dec.2017/Jan.2018
Automotive Air Pollution and Control

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Explain European cycles in brief :
i) ECE urban cycle
ii) EUDC extra urban cycle
iii) UBA cycle
iv) Berlin urban cycle
v) German bus cycle. (10 Marks)
- b. Explain inspection of vehicles in circulation with respect to traffic condition.
i) Influence of actual traffic condition
ii) Influence of vehicle maintenance (10 Marks)
- 2 a. Explain the effect of air–fuel ratio on NO_x and CO emission, with graph. (10 Marks)
b. Explain flame quench mechanism and formation of particulates in SI Engine. (10 Marks)
- 3 a. Explain the following measures in engine to control diesel emission.
i) Effect of combustion chamber geometry
ii) Effect of turbulence
iii) Effect of cetane number
iv) Effect of temperature
v) Effect of supercharging. (10 Marks)
- b. Sketch and explain the evaporative loss control device. (10 Marks)
- 4 a. Explain the effect of following diesel properties on emission :
i) Effect of viscosity and density
ii) Effect of aromatic content
iii) Effect of cetane number
iv) Effect of sulphur content. (12 Marks)
- b. Explain the following effect of additives on emission, with graph :
i) Metallic additives (08 Marks)
ii) Organic additives. (08 Marks)

PART – B

- 5 a. Discuss the thermal reactors used for exhaust gas treatment, with sketch. (08 Marks)
b. With a neat sketch, explain the construction and working of dual catalyst and 3-way catalysis. (12 Marks)

- 6 a. Discuss the harmful effects of the following on human health :
- i) lead
 - ii) NO_x
 - iii) particulate
 - iv) CO
 - v) SO_2 .
- (10 Marks)
- b. discuss the harmful effects of following on plants :
- i) SO_2
 - ii) Hydrogen fluoride
 - iii) Nitric oxide
 - iv) Smog
 - v) Hydrogen chloride.
- (10 Marks)
- 7 a. Briefly discuss the following sampling methods
- i) Sedimentation
 - ii) Filtration
 - iii) Electrostatic precipitator
 - iv) Thermal precipitator
 - v) Centrifugal method.
- (10 Marks)
- b. Explain with a neat sketch :
- i) Hart ridge smoke meter
 - ii) Bosch smoke meter.
- (10 Marks)
- 8 With a neat sketch, explain the construction and working of the following :
- a. NDIR analyser
 - b. FID.
- (20 Marks)

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