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Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
Automotive Air Pollution and Control

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1 a. Explain the influence of actual traffic conditions and maintenance of vehicles with respect to exhaust. (10 Marks)
- b. Define Driving Cycle. Explain European cycles in brief. (10 Marks)
- 2 a. Explain the 'Zeldovitch' mechanism for the formation of oxides of nitrogen and discuss about Engine variables influencing the NO_x formation in automotive engine. (10 Marks)
- b. Explain the formation of unburnt Hydrocarbon in spark ignition engine and briefly discuss about the factors influencing UBHC formation. (10 Marks)
- 3 a. What are the different measures in engines to control diesel emissions? Explain any five briefly. (10 Marks)
- b. Write a note on : i) EGR ii) control of fuel evaporative losses. (10 Marks)
- 4 a. Discuss the effect of the following gasoline fuel properties on emission:

i) Volatility	ii) Aromatic contents	iii) Octane number
iv) Additives and	v) Distillation interval.	

 (10 Marks)
- b. Explain the effects of following on pollution :

i) Volatility of fuel	ii) Carbon content	iii) Misfueling
iv) Lubricants and	v) Bio-diesel.	

 (10 Marks)

PART - B

- 5 a. Explain the Catalytic mechanism with equations for the reduction of major pollutants. (06 Marks)
- b. Explain the Three way catalytic convertor working principle, with suitable sketch. (08 Marks)
- c. With neat sketch, explain Electrostatic initiation diesel trap. (06 Marks)
- 6 a. Explain the harmful effects of the following on human health :

i) Sulphur dioxide	ii) Oxides of nitrogen	iii) Lead	iv) Carbon monoxide
v) Hydrocarbon vapours.			

 (10 Marks)
- b. Discuss the effects of various air pollutants on plants. (10 Marks)
- 7 a. Explain with sketch, 'ORSAT' apparatus used for flue gas analysis. (08 Marks)
- b. Explain with suitable sketch, working principle of Electrostatic precipitator. (08 Marks)
- c. List out the various methods used for particle size analysis. (04 Marks)
- 8 a. Explain with a neat sketch the construction and working of NDIR analyser. (10 Marks)
- b. Explain with a neat sketch the construction and working of FID. (10 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.