

FACULTY OF ENGINEERING**B.E. 3/4 (AE) I-Semester (Main) Examination, November 2013****Subject : Automotive Diesel Engines****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.****PART – A (25 Marks)**

1. What are the main objectives of fuel-injection pump? (3)
2. Define : (a) compression ratio and (b) Volumetric efficiency (2)
3. Explain stages of combustion in diesel engines. (3)
4. Name the commonly used fuel-injection pumps. (2)
5. Define (a) fuel-air ratio (b) Calorific value of fuel (c) Mean effective pressure (3)
6. Compare CI engines with SI engines with respect to
(a) Basic cycle (b) Fuel used (c) Introduction of fuel (3)
7. Draw dual cycle on p-v- and T-S diagram and mark the various processes on the cycle. (2)
8. Classify injection systems. (2)
9. Explain about charge cooling. (3)
10. Explain about emissions of oxides of nitrogen from the engine exhaust. (2)

PART – B (5x10=50 Marks)

11. Draw p-v and T - S diagram of Diesel. Obtain an expression for mean effective pressure and efficiency of the diesel cycle. (10)
- 12.(a) What are the functional requirements of an injection system? (4)
(b) Explain common rail and distributor system with neat sketches. (6)
- 13.(a) Explain the process of combustion in CI engines. (5)
(b) Briefly explain the phenomenon of knock in CI engines. (5)
- 14.(a) What are the merits and limitations of turbo charging? (5)
(b) Explain about exhaust gas recirculation. (5)
- 15.(a) Explain the method of preparing heat balance sheet for a diesel engine. (4)
(b) Explain the effect of the following factors on performance of an engine.
(i) Engine speed (ii) Air-fuel ratio & (iii) Compression ratio (6)
16. The mean effective pressure of an ideal Diesel cycle is 8 bar. If the initial pressure is 1.03 bar and the compression ratio is 12, determine the cut-off ratio and the air standard efficiency. Assume ratio of specific heats for air to be 1.4. (10)
17. What are the functions of a nozzle? With sketches explain various types of nozzles. (10)
