



B.E./B Tech.(Full Time) DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011

MECHANICAL ENGINEERING BRANCH

SIXTH SEMESTER

ME 9036 ADVANCED I. C. ENGINEERING

(REGULATIONS 2008)

Time : 3 hr

Max. Mark : 100

Answer ALL Questions

PART- A (10 x 2 = 20 Marks)

1. List down the air fuel ratio requirements of a S.I. engine.
2. What are the principal parts of I .C engine combustion chamber?
3. How a DI engine is different from an IDI engine?
4. Mention the advantages of turbo charging engines.
5. Draw the Indian driving cycle and indicate the various stages.
6. What is the principle of NDIR analyser?
7. Compare the octane number and the calorific value of alcohol and petrol.
8. List down the major constituents of natural gas and LPG.
9. What are variable geometry turbochargers?
10. Indicate any 4 features of a CRDI system.

PART- B (5 x 16 = 80 Marks)

11. i). Explain the characteristics of a homogeneous charge compression ignition engine. (8)
ii). Discuss the principle of operation of hybrid electric vehicle with a neat schematic. (8)
12. a i). Describe the various stages of combustion in a S.I. engine with a p- θ diagram. (6)
ii). Discuss briefly the various factors that affect knocking in a S.I. engine. (10)

(OR)

- b.i). Distinguish between mono point and multi point injection system. (8)
ii). Explain briefly the features of any two S.I engine combustion chambers. (8)
13. a.i). Explain with the help of a p- θ diagram the various stages of combustion in a CI engine. (8)
ii). Draw a neat sketch of a fuel spray showing the spray breakup length, spray tip penetration, spray width and spray cone angle and explain the mechanism of fuel evaporation. (8)

(OR)

- b.i). Discuss the merits and demerits of pre-combustion chambers. (10)
 - ii). What do you understand by swirl and squish? Explain its importance. (6)
- 14.a. i). Describe the mechanism of formation of CO, UBHC and NOx emissions. (6)
- ii). Explain the principle of operation of a three way catalytic convertor with a neat sketch. (10)

(OR)

- b. i). With the help of a neat sketch explain the principle of operation of Flame Ionisation Detector. (8)
 - ii). Draw the European driving cycle and explain the various stages. (8)
- 15.a i).List down the advantages and disadvantages of using hydrogen in engines. (6)
- ii).Explain briefly the various techniques of using ethanol in diesel engines. (10)

(OR)

- b.i). Mention the function of the components of CNG conversion kit employed for the use of CNG in a C.I. engine. (10)
- ii). Explain the suitability of using LPG in a S.I.engine. (6)

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