Reg. No. : | | | | | | | | | | | |

Question Paper Code : 21050

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2012.

Seventh Semester

Mechanical Engineering

080120052 — INTERNAL COMBUSTION ENGINES

(Regulation 2008)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define mean effective pressure and stoichiometric air-fuel ratio.
2. Define Octane number of a fuel and antiknock index.
3. What is an indirect injection engine?
4. List the methods of generating air swirl in the CI engines.
5. List the commonly used alternatives fuels.
6. What are the advantages of natural gas as a fuel?
7. What is a lean burn engine?
8. What is Texaco combustion process?
9. Define the extended Zeldovich mechanism.
10. What are the functions of a catalytic converter?

PART B — (5 × 16 = 80 marks)

11. (a) With simple diagrams, explain the main metering system and the choke of a modern carburetor.

Or

(b) (i) Describe in detail the stages of combustion in a SI engine. (8)

(ii) Explain briefly the measurement of knock in SI engine combustion. (8)

12. (a) Describe in detail the various factors affecting the delay period in CI engine combustion.

Or

(b) Write short notes on the following: (8+8)

(i) Open combustion chamber for diesel engines.

(ii) Diesel knock and its control.

13. (a) (i) Discuss briefly the production of ethanol from sugarcane. (8)

(ii) Compare the exhaust emissions of a methanol engine and a gasoline engine. (8)

Or

(b) What are the methods by which hydrogen can be used in SI engines? Explain.

14. (a) (i) Explain briefly a gasoline direct injection system. (8)

(ii) What are the methods of charge stratification? Explain any two methods in detail. (8)

Or

(b) (i) What is a variable compression ratio engine? Explain with a schematic diagram. (8)

(ii) How does the performance of a variable compression ratio engine is compared with that of a conventional constant compression ratio engine? (8)

15. (a) With neat sketches, discuss briefly the various pollutants formation mechanism in CI engines.

Or

(b) Explain briefly a flame ionization detector for measuring unburnt hydrocarbons.