19/4/17 (RJ)

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

Question Paper Code : 72128

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2017.

Eighth Semester

Mechanical Engineering

ME 6016 — ADVANCED IC ENGINES

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the method used to detect the phenomenon of knocking.
2. List the various types of combustion chambers used in S.I engines.
3. What is turbo charger and super charger?
4. What is ignition delay period?
5. What are soot particles? Give its typical size.
6. Write down zeldovich mechanism of NO formation.
7. Write any two merits and de-merits of using Hydrogen as fuel in IC engine?
8. What are the engine modifications required to use compressed natural gas (CNG) as fuel?
9. Write any two merits and demerits of the stratified charge engine.
10. How HCCI engines achieves simultaneous reduction in NO_x and particulate matter (PM) emissions?

PART B — (5 × 16 = 80 marks)

11. (a) Explain the stages of combustion in S.I engine with a $p-\theta$ diagram.

Or

(b) Explain the working of multi – point and gasoline direct injection systems used in S.I engines with block diagram.

12. (a) (i) Give the detailed comparison of combustion phenomenon in C.I engine and S.I engine. (8)

(ii) Give the detailed comparison of knock in C.I and S.I engines. (8)

Or

(b) Describe diesel fuel spray behavior and spray structure with neat sketch.

13. (a) (i) Discuss the mechanism of formation of HC, CO and NO in S.I engine. (10)

(ii) What is Indian driving cycle? What is the procedure adopted for it? Explain. (6)

Or

(b) Discuss the working of selective catalytic reduction (SCR) and particulate traps with neat sketch.

14. (a) Compare the fuel properties of Diesel, petrol, Bio diesel and LPG.

Or

(b) (i) Discuss the methods of using alcohol as fuel in S.I and C.I engines. (10)

(ii) Explain the emission characteristics of using hydrogen in a C.I. engine. (6)

15. (a) Explain the construction and working of Common Rail Direct Injection (CRDI) system with neat block diagram.

Or

(b) Discuss the following (i) Hybrid Electric Vehicle (HEV) and (ii) On-Board Diagnostics (OBD).
