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**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 x 2= 20 Marks)**

1. Mention the methods used to discuss the phenomenon of knocking?
2. List out the types of combustion chambers used in SI Engine?
3. What is the turbocharger and super charger?
4. What is ignition delay period?
5. What are the soot particles? Give its typical size.
6. Write down the mechanism of NO formation.
7. Write any two merits and de-merits of the Hydrogen fuel used in IC Engine.
8. What are the engine modification required to use compressed natural gas in IC Engine.
9. Write any two merits and de-merits of stratified Engine.
10. How HCCI engine achieves simultaneous reduction in NO<sub>x</sub> and particulate matters emissions?

**PART – B - (5x 16= 80 Marks)**

11. a) Explain the stages of combustion in SI engine with diagram. (16)

(Or)

(b) Explain the working of multi-point and gasoline direct injection systems used in SI engines with block diagram. (16)

12. (a) (i) Give the detailed comparison of combustion phenomenon in CI engine and SI engine. (8)

- (ii) ) Give the detailed comparison of knock in CI and SI engines. **(8)**
- (Or)
- (b) Describe diesel fuel supply behaviour and spray structure with neat sketch. **(16)**
13. (a) (i) Discuss the mechanism of formation of HC, CO and NO in SI 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 and particulate traps with neat sketch. **(16)**
14. (a) Compare the fuel properties of diesel, petrol, bio diesel and LPG. **(16)**
- (Or)
- (b) (i) Discuss the methods of using alcohol as fuel in SI and CI engines. **(10)**
- (ii) Explain the emission characteristics of using hydrogen in a CI engines. **(6)**
15. (a) Explain the construction and working of common rail direct injection system with block diagrams. **(16)**
- (Or)
- (b) Discuss the following (i) Hybrid electrical vehicle (ii) On-board Diagnostics. **(16)**