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Question Paper Code : 50842

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Eighth Semester

Mechanical Engineering

ME 6016 – ADVANCED I.C. ENGINES

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. List some fuel requirements for a SI engine.
2. Mention the type of fuel injection system commonly utilised in a SI engine.
3. Define swirl and squish.
4. Define ignition delay.
5. List out the major pollutants from a CI engine exhaust.
6. What is the use of driving cycle ?
7. What is LPG ? State its chief constituent.
8. Write any two merits of alcohol as a fuel for SI engines.
9. What is HCCI ?
10. State the necessity of onboard diagnostics.

PART – B

(5×16=80 Marks)

11. a) i) Explain the stages of combustion in a S.I. engine with the help of a pressure-crank angle diagram. (8)
- ii) Define knocking in a SI engine and also discuss about the factors responsible for knocking. (8)

(OR)

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- b) i) Draw a schematic of different SI engine combustion chambers and their characteristics. (10)
- ii) Draw a schematic of direct injection system in a SI engine. (6)

12. a) i) Discuss the significance of air-motion in a CI engine. Also define and mention the significance of swirl, tumble and squish. (3+7)
- ii) Depict atleast two types of modern day CI engine combustion chamber shapes. (3+3)

(OR)

- b) Discuss with suitable illustration the fuel spray structure, behaviour and its penetration through air stream inside the combustion chamber of a CI engine. (16)

13. a) Describe the construction and working of a three way catalytic converter with the help of a schematic. (16)

(OR)

- b) Explain with neat sketch i) Chemiluminescence's method of measuring oxides of nitrogen ii) FID method of measuring carbon monoxide. (16)

14. a) i) What are the advantages and disadvantages of using Bio-Diesel in CI engine ? (8)
- ii) List the merits and demerits of using alcohol as neat fuel in SI engines. (8)

(OR)

- b) i) Explain with an illustration the functioning LPG fuelled SI engine. (8)
- ii) Compare any five properties of ethanol, Liquefied Petroleum Gas and Compressed Natural gas. (8)

15. a) i) Describe the concept of a HCCI system with a schematic. (11)
- ii) Draw a schematic of a hybrid electric vehicle. (5)

(OR)

- b) i) Describe the operation of a common rail direct injection system with an illustration. (10)
- ii) What is a variable geometry turbocharger ? Discuss its functioning with a schematic. (6)