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Question Paper Code : 50842

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

Eighth Semester

Mechanical Engineering

ME 6016 – ADVANCED IC ENGINES

(Regulations 2013)

Time: Three hours

Maximum: 100 marks

Answer ALL questions.

PART – A

(10x2= 20 Marks)

1. List some fuel requirements for a SI engine.
2. Mention the type of fuel injection system commonly utilized 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 on board diagnostics.

PART – B

(5x16 = 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)

- b) i) Draw a schematic of different SI engine combustion chambers and their characteristics. **(8)**
ii) Draw a schematic of direct injection system in a SI engine. **(8)**
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) Explain atleast two types of 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, LPG 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 turbo-charger? Discuss its functioning with a schematic. **(6)**