

Code No: 5221AB

**R15**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**M. Tech I Semester Examinations, February - 2016**

**ADVANCED I.C. ENGINES**

**(Thermal Engineering)**

**Time: 3hrs**

**Max.Marks: 75**

**Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

**PART - A**

**5 × 5 Marks = 25**

- 1.a) Discuss about different types of heat engines. [5]
- b) Compare between super charging and turbo charging. [5]
- c) What are the stages of combustion in a SI engines? Explain. [5]
- d) Write about catalytic converter with a neat sketch. [5]
- e) Explain the concept lean burning. [5]

**PART - B**

**5 × 10 Marks = 50**

- 2.a) Write the difference between ideal models of engine cycles and real engine cycles. [5]
- b) Explain the design and operating parameters of IC engines. [5+5]

**OR**

- 3) Draw the Otto and Diesel cycle on p-v diagram and show the modification if the specific heats change with respect to temperature. [10]

4. Compare induction swirl with compression swirl with respect to their advantages and disadvantages. [10]

**OR**

5. Why does turbo charging of CI engine lead to improvement in fuel economy, while turbo charging a SI engine usually leads to decreased fuel economy. [10]

6. Briefly explain the stages of combustion in SI engines elaborating the flame front Propagation. [10]

**OR**

7. Distinguish between DI and IDI diesel engines with neat sketches. [10]

8. Compare the properties of Gasoline, Methanol and Ethanol as engine fuels; explain how they affect combustion and emission? [10]

**OR**

9. Explain the internationally accepted methods of measuring the following invisible emission  
a) Oxides of nitrogen b) Carbon monoxide c) Unburned hydrocarbons. [10]

10. What do you understand by lean burn engine and stratified charge engine? Indicate their advantages? [10]

**OR**

11. Give a brief account of LPG being used as an alternate fuel in SI engine. [10]