

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad

**M.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2019**Subject: **ADVANCED I.C. ENGINES**Branch: **ME/TE**Time: **3 hours**Max. Marks: **70****PART – A**Answer **ALL** questions of the following**5x4M=20 M**

1. Why a SI engine requires a rich mixture during idling and at full load?
2. State the purpose of turbo chargers in automotive engines.
3. What are the emission norms? Give the major pollutants that are to be controlled?
4. Write about the different types of alternate fuels available.
5. What do you understand by CRDI system?

**PART-B**Answer **ALL** questions of the following**5x10 M= 50M**

1. a) Discuss the air fuel ratio requirements of SI engine?  
b) What are homogeneous and heterogeneous mixtures? In which engines these mixtures are used? Explain.
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2. a) Explain the various factors that affect knock in SI engines.  
b) What are the different required characteristics of a good combustion chamber for S.I. Engine? Explain.
  3. a) Discuss the characteristics of DI and IDI diesel engine.  
b) What are the various factors that influence spray penetration in CI engine? Explain in detail.
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4. What do you understand by thermodynamics analysis of CI engine combustion process? Explain in detail giving governing equations.
  5. Explain with neat sketches the construction of pellet type and honeycomb type catalytic Converters .Also explain how catalytic surfaces are fabricated and discuss in detail how They perform the catalytic conversion?
- OR
6. What is smoke and explain the principle used in the measurement of smoke?
  7. a) What modifications are required in CI engine to use gaseous fuels? Explain.  
b) Explain the combustion and emission characteristics of using hydrogen in CI engine.
- OR
8. Explain the fuel characteristics of alcohols, CNG, LPG, and hydrogen's.
  9. a) Discuss about the HCCI engine.  
b) With a neat sketch explain the operation of a stratified engine.
- OR
10. Explain the working feature of CRDI diesel engine with a layout diagram.

