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06ME763

Seventh Semester B.E. Degree Examination, January 2013
Internal Combustion Engines

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART - A

1 a. Mention the simplified assumptions used on fuel – air cycle analysis. With the help of P – V diagram, explain how the variation in specific heats and dissociation of gases tend to deviate from the ideal processes. **(10 Marks)**

b. Explain how i) time losses and ii) incomplete combustion losses are accounted for in the real – cycle analysis. **(04 Marks)**

c. Determine the effect of percentage change in the efficiency of otto cycle having a compression ratio of 8. If the specific heat at constant volume increases by 1.1 percent. **(06 Marks)**

2 a. Explain with the help of a P – θ (pressure – crack angle) diagram, the combustion phenomenon in SI engines. **(08 Marks)**

b. What are the different air fuel mixture requirements to operate SI engine at different load conditions? **(06 Marks)**

c. Explain the various factors that influence the flame speed. **(06 Marks)**

3 a. Explain the effect of following engine variables on the delay period :
i) compression ratio ii) Quality of the fuel iii) Injection pressure iv) Engine speed v) Intake temperature. **(10 Marks)**

b. Explain the phenomenon of knock – in C.I engine and compare it with SI engine knock. **(06 Marks)**

c. What is delay period? Name and explain two parts of delay period. **(04 Marks)**

4 a. Explain the basic requirements of a good SI engine combustion chamber. With a neat sketch, explain I – head combustion chamber. **(10 Marks)**

b. With a neat sketch, briefly explain with advantages and disadvantages : i) Divided combustion chamber ii) M – Type combustion chamber. **(10 Marks)**

PART - B

5 a. Discuss the important quality of an SI and CI engine fuels. **(08 Marks)**

b. Explain the reasons for looking for alternate fuels for IC engines. **(06 Marks)**

c. How SI and CI engine fuels are rated? **(06 Marks)**

6 a. Discuss the important requirements of an ideal diesel injection system. **(08 Marks)**

b. Explain with reasons the necessity for gasoline injection. **(04 Marks)**

c. What is the necessity of cooling? Explain the thermosyphon cooling system. **(08 Marks)**

7 a. What is super charging? What is its effect on the following parameters : i) Power output ii) Mechanical efficiency iii) Fuel consumption? **(08 Marks)**

b. What are the requirements of a multi fuel engine? **(04 Marks)**

c. Briefly explain the working of wanked rotary combustion engine. **(08 Marks)**

8 Write short notes on the following :

a. Sources of pollutants from IC engines. b. Effects of engine pollutions on human health.

c. Thermal reactor package. d. SI engine emission control. **(20 Marks)**

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