ME - 604

B.E. VI Semester

Examination, June 2013

Internal Combustion Engines

Time : Three Hours

Maximum Marks : 100 *Minimum pass Marks: 35*

Note: Attempt five questions selecting one from each unit. Assume suitable missing/miss print data if any.

Unit - I

1. a) Compare the air standard cycle and fuel air cycles based on :
   i) Fuel-air ratio
   ii) Chemical composition of the fuel 10
   b) What is brake power? How can it be measured? Explain one method in detail. 10

OR

2. a) Explain the effect of following factors on the performance of an S.I Engine : 10
   i) Compression ratio
   ii) Air fuel ratio
   iii) Spark timing
   iv) Engine speed
   b) What is heat balance sheet? How is it prepared? 10

Unit - II

3. a) Define combustion. State general conditions necessary for combustion. 6
   b) Explain the phenomena of Knocking in S.I. engine. What are different factors which influence to knocking. Describe method to suppress it. 14

OR

4. a) Discuss the effect of following factor on flame propagation in S.I. Engine. 10
   i) Compression ratio
   ii) Fuel-Air ratio
   iii) Turbulence
   iv) Engine speed
   b) What do you mean by octane no. How is it measured for gasoline. 5
   c) The retarding of spark timing in S.I engine will reduce deterioration. "Justify the statement. 5

Unit - III

5. a) Describe various phases of C.I engine combustion. 10
   b) What is the function of fuel injection system? Explain any system with the help of a neat sketch. 10

OR

6. a) What is delay period? Discuss the effect of following factor on it
   i) Compression ratio
   ii) Engine load
   iii) Self ignition temp of fuel
   iv) Engine speed 10

b) What is induction swirl? Explain the advantages and disadvantages of induction swirl. 10

Unit - IV

7. a) What do you mean by "carburetion". Enlist the factors. Which affect the process of carburetion? 5

b) A simple Jet carburetor is required to supply 4.6 kg of air per minute. The pressure and temperature of air are 1.013 bar and 25°C respectively. Assuming flow to be isentropic and compressible and velocity coefficient as 0.8. Calculate the throat diameter of the choke for air velocity of 80 m/sec. 15

OR

8. a) What are the fundamental requirement of a good fuel injection system of an CI engine? 6

b) A four stroke engine using 0.272 kg/KWh fuel of 32° API develops 15KW per cylinder at 2000rpm. The fuel injection pressure is 120 bar and the combustion chamber pressure is 30bar. If the duration of injection is 30° of crank travel and velocity coefficient is 0.9. Determine the diameter of the fuel orifice. 14

Unit - V

9. a) What are different kinds of fuels used in I.C. engines? What are the requirements of a good gasoline fuel? 10

b) Give the advantage and disadvantage of alcohol as an alternate fuel. 10

OR

10. a) Explain the supercharging of CI Engine. 10

b) Discuss the super changing limits and modifications required for super changing in CI engine. 10