Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

ME–604

B. E. (Sixth Semester) EXAMINATION, June, 2012

(Mechanical Engg. Branch)

INTERNAL COMBUSTION ENGINES

(ME – 604)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *five* questions in all selecting *one* question from each Unit. Assume suitable missing/misprint data, if any.

Unit – I

1. (a) What is the difference between air standard cycle and fuel-air cycle analysis ? Explain the significance of fuel-air cycle. 6

   (b) Define mean effective pressure and distinguish between brake mean effective pressure and indicated mean effective pressure. 6

   (c) Define volumetric efficiency of I. C. Engine. Discuss the factors which affect volumetric efficiency. 8

Or

2. (a) List the parameters by which performance of an engine is evaluated. 10

   (b) A four cylinder engine running at 1200 r. p. m. delivers 20 kW. The average torque when one cylinder was cut

P. T. O.

is 110 Nm. Find the indicated thermal efficiency if the calorific value of the fuel is 43 mJ/kg and engine uses 360 gm of gasoline per kWh. 10

Unit – II

3. (a) Explain different stages of combustion in a S. I. Engine. 10

(b) What is Preignition ? What are its causes and remedies ? 10

Or

4. (a) Discuss the effect of the following factors on knocking in S. I. Engine : 10

(i) Compression ratio

(ii) Mass of charge induced

(iii) Engine speed

(iv) Mixture inlet temperature

(b) What are various types of combustion chambers used in S. I. Engine ? 10

Unit – III

5. (a) Explain the combustion phenomenon in C. I. Engine. 10

(b) How are the fuel injection systems classified ? Why is the air injection system not used now-a-days ? 10

Or

6. (a) What is Delay Period ? Explain the effect of various engine parameters on delay period. 10

(b) Explain "Diesel Knock". Differentiate the knocking phenomena of S. I. and C. I. Engine. 10

Unit – IV

7. (a) Define "lubrication". What are the objectives of lubrication ? Discuss film and boundary lubrication. 10

   (b) Describe the battery ignition system of an SI engine with the help of a neat sketch. 10

Or

8. (a) Describe with suitable sketch, the following systems of a modern carburettor : 12

   (i) Main metering system

   (ii) Acceleration pump system

   (b) State the application, advantages and disadvantages of air cooling system. 8

Unit – V

9. (a) What are the desired properties of a good IC Engine fuel ? 10

   (b) What are the advantages and disadvantages of Hydrogen as I. C. Engine fuel ? 10

Or

10. (a) What is Supercharging ? Discuss the main objectives of supercharging. 10

    (b) Derive an expression for the power requirement of an I. C. Engine supercharger. 10