

ME - 604**B.E. VI Semester**

Examination, December 2013

Internal Combustion Engines*Time : Three Hours**Maximum Marks : 70*

- Note:** 1. Attempt any five questions.
2. All questions carry equal marks. Assume suitable data is required.
3. Answer should be brief and to the point.

1. Compare the Otto and diesel cycles for
 - a) Same compression ratio and same heat input.
 - b) Same constant maximum pressure and same heat input.
 - c) Same maximum pressure and temperature.
 - d) Same maximum pressure and output. **rgpvonline.com**
2. A four-cylinder S.I engine has a bore of 60mm and a stroke of 85mm. It runs at 3000 r.p.m and is tested at this speed against a brake which has a torque arm of 0.35m. The net brake load is 160N and the fuel consumption is 6.5 liter/hr. The specific gravity of the fuel used is 0.78 and it has a lower calorific value of 44000 kJ/kg. A Morse-test is carried out and the cylinders are cut out in the order 1, 2, 3, 4 with the corresponding brake loads of 114, 110, 112 and 116 N respectively. Calculate for this speed the bp, the bmep, the brake thermal efficiency, the bsfc, the ip, the mechanical efficiency and the imep.

3. a) What is meant by "ignition limits"? What are the ignition limits for different hydrocarbons?
b) Discuss the effect of the following engine variables on flame speed
 - i) Fuel-air ratio.
 - ii) Compression ratio.
 - iii) Engine load.
 - iv) Turbulence.
 - v) Engine speed.
4. What are the requirements of a combustion chamber for S.I. Engine? What are the various types of combustion chambers used in S.I.engines? Explain them briefly.
5. a) Explain the phenomenon of diesel Knock. Compare it with the phenomenon of detonation in S.I. Engine.
b) Discuss the advantages and disadvantages of induction swirl.
6. a) Describe a battery ignition system with the help of a sketch.
b) What is the function of a carburetor? What is carburetion. Derive an expression to calculate the air/fuel ratio for a simple carburetor neglecting the compressibility effect of air.
7. a) Explain the different methods of supercharging arrangements.
b) What are the different fuel characteristics on which the performance of S.I engine depends?
8. Write short notes on any Four of the following:
 - a) Desirable properties of good lubricants.
 - b) Octane number and cetane number.
 - c) M.P.F.I.
 - d) Solex carburetor.
 - e) Wankel rotary engine. **rgpvonline.com**