

What is the effect of supercharging on the following parameters:

- i) Power output
- ii) Mechanical efficiency
- iii) Fuel consumption

Roll No

ME - 604

B.E. VI Semester

Examination, June 2016

Internal Combustion Engines

Time : Three Hours

Maximum Marks : 70

- Note:* i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
- ii) All parts of each questions are to be attempted at one place.
- iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
- iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What is brake specific fuel consumption?
- b) What do you understand by the term mean effective pressure?
- c) Explain in brief the firing order.
- d) Describe how the indicated power of a multicylinder engine is measured.

OR

A four stroke four cylinder diesel engine running at 2000 rpm develops 60kw. Brake thermal efficiency is 30% and calorific value of fuel is 42MJ/kg. Engine has a bore of 120mm and stroke of 100mm. Take $\rho_a = 1.15\text{kg/m}^3$. Air fuel ratio = 15:1 and $\eta_m = 0.8$. Calculate :

- i) Fuel consumption (kg/s);
 - ii) Air consumption (m^3/s);
 - iii) Indicated thermal efficiency;
 - iv) Volumetric efficiency;
 - v) Brake mean effective pressure and
 - vi) Mean piston speed.
2. a) Describe the term H.U.C.R.
 b) Explain in brief the Performance number.
 c) What is ignition lag for a SI Engine?
 d) Discuss in brief various types of combustion chambers for a SI Engine.

OR

How the retardation of spark timing in a S.I. Engine reduce detonation? Discuss in brief.

3. a) What are knock inhibitors?
 b) What is D.I. Engine?
 c) Differentiate the Physical and Chemical delay.

- d) Discuss with the suitable diagram combustion in CI Engine.

OR

What are the rotary engines? Discuss the basic principle.

4. a) What is Scavenging?
 b) What is the necessity of cooling the engine?
 c) What is mist lubrication?
 d) What are the various alternative fuels for an IC Engine?

OR

An experimental four-stroke gasoline engine of 1.7 litre capacity is to develop maximum power at 5000 revolution per minute. The volumetric efficiency is 75% and the air fuel ratio is 14:1. Two carburetors are to be fitted and it is expected that at maximum power the air speed at the choke is 100 m/s. The coefficient of discharge for the venturi is assumed to be 0.80 and that of main jet is 0.65. An allowance should be made for emulsion tube, the diameter of which can be taken as 1/3 of the choke diameter. The gasoline surface is 6mm below the choke at this engine condition. Calculate the sizes of a suitable choke and main jet. The specific gravity of the gasoline is 0.75. P_a and T_a are 1 bar and 300K respectively.

5. a) What are the objects of supercharging?
 b) What are the limitations of Supercharging in an IC Engine?
 c) Explain in brief the term turbo charging.
 d) Discuss the supercharging of two stroke engines.

OR