

[4]

- d) With sketches explain gear driven and exhaust driven supercharging methods.

OR

Write detailed note on supercharging limits for SI and CI engines.

Total No. of Questions : 5]

[Total No. of Printed Pages : 4

Roll No

ME-604

B.E. VI Semester

Examination, December 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.

Unit - I

1. a) What do you mean by V-engine based on cylinder arrangement?
- b) An engine at full load delivers 100BHP. It requires 25hp to rotate it without fuel at the same speed. Find its mechanical efficiency.
- c) Define the terms brake thermal efficiency and volumetric efficiency related to IC engines.

- d) Show that the mean effective pressure of an Otto cycle may be expressed in the form:

$$p_m = \frac{n_{th} \Delta p}{(r-1)(\gamma-1)}$$

Where n_{th} is the thermal efficiency of the cycle, Δp is the pressure rise during the heat transfer to the cycle, r is compression ratio and γ is the ratio of specific heats of the working fluid.

OR

What is the difference between air cycle and fuel-air cycle? What are the assumptions in fuel-air cycle? Explain taking the example of Otto Cycle.

Unit - II

2. a) What do you mean by Ignition Limits?
- b) List the stages of combustion in SI engines.
- c) Discuss the effect of compression ratio on flame propagation.
- d) What is knocking in SI engines? Discuss the effect of various engine variables on SI engines knock.

OR

Discuss about the various type of combustion chamber in SI engines.

Unit - III

3. a) Compare diesel knock with detonation in SI engines.
- b) What is the effect of Cetane number on ignition delay and knocking in CI engines?
- c) Write the three basic methods of generating swirl in a CI engine combustion chamber.
- d) Discuss the various stages of combustion in CI engines.

OR

Write a detailed note on Wankel Rotary combustion engine.

Unit - IV

4. a) What is the purpose of silencer?
- b) What do you mean by Common Rail Injection System?
- c) Discuss purpose of lubrication in IC engines.
- d) What is principle of carburetion? Explain the working of simple carburetor.

OR

With the help of sketch discuss the working principle of magneto ignition system.

Unit - V

5. a) Discuss the effect of altitude on air fuel ratio of SI engines.
- b) What are the objectives of supercharging?
- c) Why super charging in SI engines is employed only for aircraft and racing car engines.