

ME - 604 B.E. VI Semester
Examination, December 2014
Internal Combustion Engines

Time: Three Hours Maximum Marks: 70

Note: Attempt one question from each unit.

Unit -1

- 1.a) What is dissociation? How does it affect power developed by the engine? 7
b) A large diesel engine run on four-stroke cycle at 2000 r.p.m. The engine has a displacement of 25 litres and a brake mean effective pressure of 0.6 MN/m². It consumes 0.018 Kg/s of fuel (Calorific value = 42000 kJ/kg). Determine the brake power and brake thermal efficiency. 7

Or

- 2.a) What are important parameters considered while deciding firing order for multi cylinder engine? 7
b) A four cylinder, four stroke, spark ignition engine develops a maximum brake torque of 160 Nm at 3000 rpm. Calculate the engine displacement, bore and stroke. The brake mean effective pressure at the maximum engine torque point is 960 kPa. Assume bore is equal to stroke. 7

Unit-II

- 3.a) Explain the phenomenon of knocking in SI engines. What are the factors which influence the knocking? 7
b) What are the factors that limit the compression ratio in petrol engines?
4. a) Why is spark advance required? Discuss the factors that affect ignition timing. 7
b) Discuss the general principles of SI engine combustion chamber design. 7

Unit-III

- 5.a) What is the difference between physical delay and chemical delay? 7
b) Explain briefly the following combustion chambers:
i) Open or direct combustion chamber
ii) Turbulent chamber. 7

Or

- 6.a) With the help of P.O diagram explain combustion phenomenon in CI engine. 7
b) How does induction Swirl in a CI engine helps in increasing indicated thermal efficiency? 7

Unit-IV

- 7.a) Describe with suitable sketches the following systems of a modern carburettor. 7
i) Economiser system ii) Acceleration pump system,
b) How are solid injection system classified? 7

Or

- 8.a) Explain wet sump lubrication system with the help of a neat sketch. 7
b) A four cylinder four-stroke engine having diameter and length of stroke as 100 mm and 120 mm respectively is running at 1800 rpm. Its carburettor venturi has a 28mm throat. Assuming co-efficient of air flow 0.8, density of air 1.2 Kg/m³ and volumetric efficiency of the engine as 75%, determine the suction at the throat. 7

Unit-V

- 9.a) Enumerate the main consideration in limiting the degree of supercharging of a C.I. engine. 7
b) Explain briefly with neat sketches various types of supercharging arrangement. 7