

--	--	--	--	--	--	--	--	--	--

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Automotive Engine Components Design and Auxiliary Systems

Time: 3 hrs.

Max. Marks: 80

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. Use of Data handbook is permitted.*

Module-1

- 1 a. With a neat sketch, explain the basic components of any two engine components. (10 Marks)
b. Write short notes on:
(i) Cast iron cylinder
(ii) Aluminium cylinder block (06 Marks)

OR

- 2 a. The cylinder of a four stroke diesel engine has the following specifications:
BP = 7.5 KW, speed = 1400 rpm, Indicated mean effective pressure = 0.35 MPa,
Mechanical efficiency = 0.8, Poisson's ratio = 0.25, FOS for all parts 6. Calculate:
(i) Bore and length of the cylinder liner
(ii) Thickness of the cylinder liner/wall (also calculate apparent and net stresses)
(iii) Thickness of the cylinder head
(iv) Number of studs, nominal diameter of studs and the pitch of studs. (12 Marks)
b. With a neat sketch explain dry and wet liner. (04 Marks)

Module-2

- 3 a. Write the functions, materials of crankshaft and explain its construction with sketch. (10 Marks)
b. Explain the forces acting on connecting rod. (06 Marks)

OR

- 4 a. Derive an expression for cross-section of a connecting rod. (08 Marks)
b. Determine the I-cross section of a connecting rod for a high speed I.C. engine for the following data:
Bore = 125 mm
Length of the connecting rod = 300 mm
Maximum gas pressure = 3.5 MPa
Compressive stress = 330 MPa
FOS = 5 (08 Marks)

Module-3

- 5 a. With neat sketch, explain the working principle of two stroke engine with port timing diagram. (10 Marks)
b. Discuss theoretical scavenging process. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Write a brief comparison between two stroke SI and CI engines. (06 Marks)
b. Explain the construction of a Poppet valve with sketch. (04 Marks)
c. What are the material requirements for an exhaust valve? (06 Marks)

Module-4

- 7 a. Explain with neat sketches:
i) Baffle type muffler
ii) Wave cancellation muffler
iii) Resonance type muffler
iv) Absorption type muffler (12 Marks)
b. What are the functions of lubrication systems? (04 Marks)

OR

- 8 a. Explain thermosyphon cooling system with sketch. (08 Marks)
b. Describe the functions and construction of inlet and exhaust manifolds with sketch. (08 Marks)

Module-5

- 9 a. With a P-V diagram, explain the concept of supercharging an engine. (08 Marks)
b. What are the requirements of lubricants? (08 Marks)

OR

- 10 a. Explain briefly:
i) Petroil lubrication (08 Marks)
ii) Drysump lubrication (08 Marks)
b. What are the effects of supercharging on an engine? (08 Marks)
