

# ONE TIME EXIT SCHEME

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## Fifth Semester B.E. Degree Examination, April 2018 Automotive Engines and Components

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any FIVE full questions, selecting at least TWO questions from each part.  
2. Use of design data hand book is allowed.

### PART – A

- 1 a. Explain with neat sketch. The working of 4 – stroke SI engine. (10 Marks)  
b. What are heat engines? Classify them in detail. (06 Marks)  
c. Compare the two stroke and four stroke engines. (04 Marks)
- 2 a. Explain with neat sketches different types of scavenging system. (10 Marks)  
b. Explain with neat sketches the different types of port timings diagram. (10 Marks)
- 3 a. What are the functions of cylinder neat gasket? How it is made? Explain with a neat sketch. (10 Marks)  
b. Explain with neat sketches the types of engines based on cylinders position used in IC engine and list functions of cylinder in IC engine. (10 Marks)
- 4 a. Write a note on IC engine manifolds. With a neat sketch explain the inlet and exhaust manifolds for a multi cylinder engine. (10 Marks)  
b. With neat sketches. Explain the various types of mufflers used in IC engine. (10 Marks)

### PART – B

- 5 a. Briefly explain the terms :  
i) Piston slap ii) Compensation of thermal expansion in Pistons. (04 Marks)  
b. Design a cast iron piston for a 4–stroke engine form the following data :  
Cylinder bore dia = 100 mm  
Stroke length = 120 mm  
Gas pressure = 5 MPa  
BMEP = 0.5 MPa  
Fuel consumption = 0.15 kg  
Speed = 2200 rpm. (16 Marks)
- 6 Design a connecting rod for a petrol engine for the following data :  
Diameter of the piston = 110 mm  
Length of the connecting rod = 325 mm  
Stoke length = 150 rpm  
Speed = 1500 rpm  
Over speed = 2500 rpm  
Compression ratio = 4 : 1  
Maximum explosion pressure = 2.5 MPa. (20 Marks)

- 7 a. Why balancing of crank shaft is needed? How it is achieved? (04 Marks)
- b. Design a plain carbon steel crankshaft for a single acting four stroke single cylinder engine for the following data :
- |                             |                         |
|-----------------------------|-------------------------|
| Bore                        | = 400mm                 |
| Stroke                      | = 600mm                 |
| Engine speed                | = 200 rpm               |
| Mean effective pressure     | = 0.5 N/mm <sup>2</sup> |
| Maximum combustion pressure | = 2.5 N/mm <sup>2</sup> |
| Weight of flywheel used     | = 50 kN                 |
| Total belt pull             | = 6.5 kN.               |
- (16 Marks)
- 8 a. What are the different components of the valve actuating mechanism? Explain briefly with neat sketch. (10 Marks)
- b. Write short notes on :
- Valve timing diagram
  - Valve cooling. (10 Marks)

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