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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E. - Automobile Engineering

Semester End Examination; June - 2016

Automotive Engines and Components

Time: 3 hrs

Max. Marks: 100

Note: Answer any FIVE full questions, selecting ONE full question from each unit.

UNIT - I

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| 1 a. | Define heat engine. What are the main classifications of heat engines? Explain them. | 7 |
| | b. List the differences between two stroke and four stroke engines. | 5 |
| | c. Explain the principle of operation of four stroke petrol engine with neat sketches. | 8 |
| 2 a. | Discuss the differences between ideal and actual valve timing diagrams of petrol engine. | 6 |
| | b. List the factors on which the IC engines are classified. | 6 |
| | c. List the theoretical scavenging processes and discuss any two. | 8 |

UNIT - II

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|------|---|----|
| 3 a. | Discuss in detail the construction of the following components along with their function and materials used : | 12 |
| | i) Cylinder block ii) Crank case iii) Cylinder head | |
| | b. What are the function of engine inlet and exhaust manifolds? Discuss the materials used and their construction. | 8 |
| 4 a. | With neat sketch explain different types of cylinder liners. Also list their advantages and limitations. | 12 |
| | b. What is a gasket? Discuss the requirements of gaskets and list the materials used for making gaskets for use in automobiles. | 8 |

UNIT - III

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| 5 a. | With a neat sectioned sketch name the parts of an IC Engine piston. Also state the functions of the piston. | 10 |
| | b. Write a short note about piston pin with a neat sketch. | 5 |
| | c. Discuss various types of piston failure. | 5 |
| 6 a. | Discuss the construction of piston rings. List the type of piston ring gaps with neat sketches. Also list its functions. | 10 |
| | b. Name different types of automobile pistons. Describe any two in detail. | 10 |

UNIT - IV

- 7 a. Discuss the construction of connecting rod with neat sketch. List its function and materials used. 10
- b. With a neat sketch discuss the construction and functions of a crank shaft. Also list the materials used. 10
- 8 a. What are the requirements of engine bearings? Discuss different types of engine bearings and the materials used. 12
- b. With a neat sketch explain vibration damper. 8

UNIT - V

- 9 a. With the neat sketch explain the construction and working of sodium cooled valve. 8
- b. List the requirements of the materials used for making exhaust valve. 6
- c. Discuss various types of drives for operating engine cam shaft. 6
- 10 a. With a neat sketch discuss the constructions and working of valve seats, guides and valve spring. 10
- b. A six-cylinder gasoline engine operates on the four-stroke cycle. The bore of each cylinder is 80 mm and the stroke 100 mm. The clearance volume per cylinder is 70 cc. At a speed of 4000 rpm the fuel consumption is 20 kg/h and the torque developed is 150 Nm. Calculate, 10
- (i) the brake power (ii) the brake mean effective pressure (iii) Brake thermal efficiency if the calorific value of the fuel is 43000 kJ/kg and (iv) compression ratio.

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