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

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Mechanical Engineering

Semester End Examination; Dec. - 2019

**Automotive Engineering**

Time: 3 hrs

Max. Marks: 100

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

## UNIT - I

- 1 a. Explain in detail, the mechanism of lubrication in parallel surfaces. 10
- b. With a neat diagram, explain crank case ventilation. 10
- 2 a. Explain forced circulation cooling system. 10
- b. With a neat diagram, explain pressure cooling system. 10

## UNIT - II

- 3 a. Explain different pump and nozzle arrangement used in CI engine for an injection system. 10
- b. With a neat diagram, explain a method of controlling quantity of fuel injected in a CI engine using Jerk type pump. 10
- 4 a. List and explain different sensors for an electronic fuel injection system, also mention merits and demerit of EFI system. 10
- b. List different functional division of MPFI system and explain D-MPFI and L-MPFI gasoline injection system with a block diagram. 10

## UNIT - III

- 5 a. With a neat diagram, explain sliding contact type centrifugal advance mechanism. 10
- b. Explain Dwell angle with a neat diagram. 10
- 6 a. With a neat diagram, explain Hartridge smoke meter. 10
- b. Sketch and explain construction and working principle and NDIR analyzer. 10

## UNIT - IV

- 7 a. List different type of dry friction clutches and explain cone clutch with a neat diagram. 10
- b. Explain semi-centrifugal clutch with a neat diagram. 10
- 8 a. With a neat diagram, explain sliding mesh type of gear box. 10
- b. Explain epicyclic gear box with a neat diagram. 10

## UNIT - V

- 9 a. Explain propeller shaft with a neat diagram. 10
- b. Explain with a neat diagram with a principle and working of Hotchkiss drive for rear axle devices. 10
- 10 a. With a neat diagram of Drum brake, explain its construction and types. 10
- b. With a neat diagram, explain layout and component of a hydraulic brakes system. 10