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

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Automobile Engineering

Semester End Examination; Feb. - 2021

Auxiliary Systems of Automotive Engines

Time: 3 hrs

Max. Marks: 100

## Course Outcomes

The Students will be able to:

CO1: Identify the different methods of fuel supply systems in SI engine, construction, working and their advantages, disadvantages.

CO2: Identify and elaborate different ways of fuel supply systems in CI engines and their working.

CO3: Design different cooling systems used in IC engines and their working principles.

CO4: Identify appropriate lubrication system for IC engines and ignition systems for SI engines and explain their working principles.

CO5: Understand the basic principles of supercharging and turbo charging and design modifications of an engine for supercharging and turbo charging.

**Note: I) PART - A** is compulsory. **Two** marks for each question.

**II) PART - B:** Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
I a.	Mention the mixture requirement for steady state operation.	2		CO1	
b.	Define how fuel quantity injected / stroke can be varied in inline injection and CRDI injection?	2		CO2	
c.	Why over cooling in an engine harmful?	2		CO3	
d.	Define FHP.	2		CO4	
e.	What are the objects of super charging?	2		CO5	
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
1 a.	Sketch and explain the AC mechanical fuel pump.	9	L3	CO1	P1,2
b.	Sketch and explain the working principle of carter carburetor.	9	L3	CO1	P1,2
c.	Discuss the advantages and disadvantages of petrol injection.	9	L3	CO1	P1,2
<b>UNIT - II</b>		<b>18</b>			
2 a.	What are all the functional requirements of a diesel injection system?	9	L2	CO	P1,2
b.	Sketch and explain the working of fuel injector.	9	L2	CO2	P1,2
c.	Sketch and explain the high pressure pump used in CRDI injection system.	9	L2	CO2	P1,2
<b>UNIT - III</b>		<b>18</b>			
3 a.	Discuss the piston and cylinder wall temperature distribution.	9	L3	CO3	P1,2
b.	Sketch and explain thermostatically controlled forced circulation cooling system.	9	L3	CO2	P1,2

c. Sketch and explain the following:

i) Pressure Radiator cap

9 L3 CO3 P1,2

ii) Thermostat

**UNIT - IV**

**18**

4 a. Discuss the important properties of a lubricant.

9 L4 CO3 P1,2

b. Sketch and explain flash and pressure lubrication system.

9 L4 CO2 P1,2

c. Sketch and explain minimum-maximum speed governor.

9 L4 CO2 P1,2

**UNIT - V**

**18**

5 a. Discuss the effect of supercharging on power output and fuel consumption.

9 L5 CO3 P1,2

b. With schematic diagram, discuss the three different methods of turbo charging.

9 L5 CO2 P1,2

c. With schematic diagram, explain the two stage turbo charged engine and its advantages.

9 L5 CO2 P1,2

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