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MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

III SEMESTER B.TECH. (AUTOMOBILE ENGINEERING)

END SEMESTER MAKE-UP EXAMINATIONS, DEC 2018

SUBJECT: THEORY OF AUTOMOTIVE ENGINES [AAE 2151]

REVISED CREDIT SYSTEM
(24/12/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

1A. List the different types of mufflers used in Internal Combustion engines and explain any one of them. **(03)**

1B. With a help of sketch, list various components of an Internal Combustion engine. **(03)**

1C. Explain the constant volume cycle using pressure volume diagram. **(04)**

2A. Describe the working of scavenging pump of an Internal Combustion engine. **(02)**

2B. Discuss the parameters which affect the flame propagation inside the combustion chamber of an Internal Combustion engine. **(03)**

2C. A Diesel engine develops 5 kW. Its indicated thermal efficiency is 30% and mechanical efficiency 57%. Estimate the fuel consumption of engine in kg/hr, litres/hr, indicated specific fuel consumption and brake specific fuel consumption. **(05)**

3A. Compare the up-draft type of carburetor with horizontal type of carburetor. **(02)**

3B. Enumerate the defects in simple carburetor of an Internal Combustion engine. **(04)**

3C. Determine the diameter of a fuel orifice for a 4-stroke engine developing 15 kW per cylinder at 2000 rev/min, using 0.272 kg/kW-hr fuel of 32°. The duration of injection is 30° of crank travel. The fuel injection pressure is 120 bar and the combustion chamber is 30 bar. Take velocity coefficient 0.9. **(04)**

4A. Compare homogeneous charged gasoline direct injection engine with stratified charged gasoline direct injection engine. **(02)**

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4B. Distinguish between fin and corrugated type of radiator and tube and fin matrix type of radiator. **(04)**

4C. Sketch and explain working of the semi-pressure type of lubrication system and mention the merits of pressure lubrication system. **(04)**

5A. Describe the mechanism available in In-line fuel injection pump to regulate the fuel delivery. **(02)**

5B. Explain the construction and working of screw compressor type of supercharger. **(04)**

5C. Sketch and Describe the construction of a Stirling engine using rhombic drive. **(04)**