Code No: RT22032 **R13** SET - 1

II B. Tech II Semester Supplementary Examinations, November - 2018
THERMAL ENGINEERING-I
(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1. a) Discuss about loss due to rubbing friction.
   b) Explain about turbo charging.
   c) Write a short note on knock limited parameters.
   d) Discuss about indirect injection combustion chambers.
   e) Discuss the importance of inter cooler.
   f) Explain about chocking.

PART -B

2. a) Explain about heat loss factor and exhaust blow down.
   b) What is spark advance? Explain how it affects the peak pressure in an IC engine.

3. a) Explain the actual port timing diagram of a two stroke SI engine and compare with ideal port timing diagram.
   b) Explain the principle of super charging. Write its applications and advantages.

4. a) Explain in detail various factors that influence the flame speed.
   b) Discuss the important qualities of SI and CI engine fuels.

5. a) Explain the variables affecting performance characteristics of an IC engine.
   b) Find the air –fuel ratio of a four strokes, single cylinder, air cooled engine with fuel consumption time for 0.1 m^3 is 16 sec. The load is 17 kg at a speed of 3000 rpm. Find also brake specific fuel consumption in kg/kWh and brake thermal efficiency. Assume the density of air as 1.2 kg/m^3 and specific gravity of fuel as 0.7. The lower heating value of fuel is 43MJ/kg and dynamometer constant is 5000.

6. a) A single acting two stage compressor with complete inter cooling delivers 11 Kg/min of air at 16 bar. The suction occurs at 1 bar and 25^0C. The compression and expansion process are reversible, polytrophic index = 1.32. Calculate (i) Power required driving the compressor (ii) Isothermal efficiency (iii) Volumetric efficiency of both the compressors; if the clearance ratios for LP and HP cylinder are 0.04 and 0.06 respectively.
   b) Discuss about power producing and power absorbing machines.

7. a) With a neat sketch explain the working of Lysholm compressor.
   b) Explain about surging and chocking.
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