

B.TECH SEM - III (2007 COURSE) (MECHANICAL ENGG.) :

SUMMER - 2018

SUNJECT: APPLIED THERMODYNAMICS

Day: **Tuesday**
Date: **22/05/2018**

S-2018-2585

Time: **02.30 PM TO 05.30 PM**
Max Marks. 80

N.B

- 1) **Q. No. 1 and Q. No. 5 are COMPULSORY.** Out of remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the **RIGHT** indicate full marks
- 3) Answer to both the sections should be written in **SEPARATE** answer books.
- 4) Use of non – programmable calculator is **ALLOWED.**

SECTION - I

- Q.1**
- a) Explain superheater with neat sketch. (05)
 - b) Explain the PMM – II. (05)
 - c) Explain non flow processes with P – V diagram. (04)
- Q.2** A cannot engine works between heat reservoirs at 120°C & 20°C . Determine it's thermal efficiency. If the heat absorbed by the engine is 1200 KJ/ min determine the power developed by the engine. Explain clausius inequality (13)
- Q.3** Explain & derive the air standard efficiency of Dual cycle with neat sketch. Also classify different types of calorimeters for measurement of dryness fraction (13)
- Q.4** Draw the sketches of followings & also give it's Location & function (13)
- i) Economizer
 - ii) Fusible plug
 - iii) Air pre heater
 - iv) Water level indicator

SECTION - II

- Q.5**
- a) Explain need of multistage compressors. (05)
 - b) Explain vane blower with sketch (05)
 - c) Explain bomb calorimeter with neat sketch. (04)
- Q.6** A single stage single acting compressor with bore 15cm & stroke 20cm runs at 200 rpm. Air is drawn in at 1 bar & 25°C . Air is delivered at 6 bar. Law of compression is $PV^{1.3} = \text{constant}$. Determine FAD & indicated power required to drive the compressor in KW. (13)
- Q.7** Differentiate between exergy & energy. Also explain second law efficiency. Distinguish clearly between Reversible work & exergy. (13)
- Q.8** Differentiate between rotary & reciprocating air compressors. Explain surging choking stalling of rotary compressors. (13)