B.Tech. MECHANICAL ENGINEERING (BTMEVI)

Term-End Examination

June, 2012

BIME-010 : THERMAL ENGINEERING

Time : 3 Hours   *Maximum Marks : 70*

Note: *Attempt **any seven** questions.*
*All the questions are to be answered in **English** language only. Use of scientific calculator is **permitted**.*

1. Describe with a neat sketch the construction and working of single stage single acting reciprocating Air Compressor.   **10**

2. A single - stage reciprocating compressor takes 2 m^3 of air per minute at 1.013 bar and 15°C and delivers it at 7 bar. Assuming that the law of compression is $PV^{1.35}$ = constant , and the clearance is negligible. Calculate the indicated, power. Give advantages of multi stage compression.   **10**

3. How the actual indicator diagram differs from that of theoretical one for a spark ignition engine ? Also draw the P-V diagram.   **10**

4. Discuss the working of Four stroke diesel engine with neat sketch.   **10**

5. Explain with the help of neat sketch the working **10**
   of a jerk type fuel injection pump used in diesel
   engines.

6. Explain how air fuel ratio effects power output, **10**
   bsfc, CO, HC and NOX emissions in SI engines ?

7. Explain the phenomenon of knock in CI engines **10**
   and compare it with SI engine knock.

8. With the help of a neat sketch , explain the **10**
   combustion process in a spark ignition engine.

9. What do you understand by heat balance sheet **10**
   of an engine ? Why friction power loss of an
   engine is not reflected in such a heat balance
   sheet ?

10. Write short notes on *any two* of the followings :

   (a) Morse test for measurement of frictional **5**
       power in engines.

   (b) Perfect intercooling in a reciprocating air **5**
       compressor.

   (c) Battery and coil ignition system. **5**

   ———————