Total No. of Pages -02 Roll No. [illegible]

I[st] SEMESTER **B.Tech.**

END SEMESTER EXAMINATION Nov./Dec. -2015

ME-101 BASIC MECHANICAL ENGG.

Time: 3:00 Hours *Max. Marks: 50*

Note: Use separate sheet for part-A and part-B. Answer 5 questions from each part. Each question carries equal mark. Assume suitable missing data, if any.

Part A

1. Show that the efficiency of a reversible engine operating between two given constant temperatures is maximum . (5)

2. Show that the COP of a heat pump is greater than COP of a refrigerator by unity (5)

3. Prove that the efficiency of the Otto cycle depends only on the compression ratio. (5)

4. An oil film of thickness 1.5 mm is used for lubrication between a square plate of 0.9 m x 0.9 m and on an inclined plane having 20 degree inclination from the horizontal. The weight of the square plate is 392.4 N and it slides down the plane with a uniform velocity of 0.2 m/s. Find the dynamic viscosity of the oil. (5)

5. State and prove the Pascal's law. (5)

6. Water is flowing through a pipe of 5 cm diameter under a pressure of 29.43 N/cm^2 and with mean velocity of 2.0 m/s. Find the total head of the water at a cross section which is 5 m above the datum line. (5)

7. Write short notes on :
   a) Thermal power plant . (2)
   b) Steady flow mass and energy balance equation (3)

Part B

1. Describe in detail shielded metal Arc welding . (5)
2. What are the different types of defects in casting and their remedies. (5)
3. Explain the classification of plain carbon steel. (5)
4. What are the operations performed on Lathe machine. Explain in detail. (5)
5. Name the different types of Vernier Callipers. Explain any one with neat sketch. (5)
6. What are the allowances provided on Pattern, Explain them (5)
7. Write short notes on :
   (a) Slip Gauges. (2)
   (b) Micrometer (3)