Total No. of Questions :8] *[Total No. of Printed Pages :2*

Roll No .....

MMTP-302(C)

M.E./M.Tech., III Semester

Examination, December 2016

Pumps, Blowers and Compressors (Elective-II)

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions out of eight.
ii) All questions carry equal marks.

1. a) What are the primary differences between pump, blowers and compressors? Discuss in terms of pressure rise and volume flow rate.
   b) Differentiate between net positive suction head and required net positive suction head.

2. a) How does a centrifugal pump import pressure energy to the fluid. Explain the mechanism involved.
   b) Discuss the factors. Which affect performance of a centrifugal pump.

3. Prove that for N-stage reciprocating air compressors with perfect intercooling work input is given by

$$W = \frac{Nn}{n-1} P_1 V_1 \left[\left(\frac{P_{n+1}}{P_1} \right)^{\frac{n-1}{Nn}} - 1 \right]$$

4. a) Discuss the classification of rotary compressors.
   b) List the advantages of rotary compressors as compared to reciprocating compressors.

5. An axial flow compressors with compression ratio of 1.4 draws air at 22°C. The compression process is approximated as an isentropic process. The stay nation condition at this stage is 300K. The blade velocity in being 200m/sec. Draw velocity triangles for an air angle of 20° and determine vane angles. Also calculate the degree of reaction.

6. Describe with a neat sketch the working of a vane blower compressor and show its P-V diagram. Discuss it's application also.

7. a) Define static and total head quantities with respect to compressors.
   b) What do you understand by slip factor? Explain its significance.

8. Write short notes on any two :
   a) Cavitation
   b) Turbo blowers
   c) Performance characteristics of centrifugal pump

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