

Roll No .....

**ME-502 (GS)**  
**B.E. V Semester**  
Examination, December 2017  
**Grading System (GS)**

**Turbo Machinery**

*Time : Three Hours*

*Maximum Marks : 70*

- Note:* i) Attempt any five questions.  
ii) All questions carry equal marks.  
iii) Steam table permitted.

1. a) Write an application of first law of thermodynamics in turbo machines. 10  
b) Explain Impulse and Reaction Turbo machines. 4
2. a) Explain governing and performance characteristics of steam turbines. 8  
b) Define U.F. curtis stage and Rateau stage of steam turbine. 6
3. Write short notes on following: 14
  - a) Utilization factor
  - b) Effect of blade and Nozzle losses on vane efficiency
  - c) Sator and carry over efficiency

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4. a) Explain working of Francis turbine with neat sketch. 10  
b) How can be classified centrifugal pumps. 4
5. a) Explain performance and characteristic of water turbine. 10  
b) Define slip coefficient of centrifugal blower. 4
6. a) Derive an expression for work done, temperature and pressure ratio for centrifugal compressor. 8  
b) Define surging and isentropic efficiency of Axil flow compressor. 6
7. a) Define positive displacement machines. 4  
b) Explain with neat sketch diagram working of
  - i) Torque converter
  - ii) Accumulator 10
8. A Kaplan turbine has running diameter of 4m and hub diameter of 1.2m. Discharge through the turbine = 7000litter/sec. The Hydraulic and mechanical efficiencies are 90% and 93% respectively.  
Assume no whirl at outlet  
Find neat head and power developed by the turbine. 14

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