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Roll No ....

MMTP-204
M.E./M.Tech., II Semester
Examination, December 2013
Steam and Gas Turbine

Time : Three Hours

Maximum Marks : 70

Note: Attempt any five questions out of eight. All questions carry equal marks. Assume suitable missing data, if any. Use of steam table and moller chart is permitted in the examination.

1. a) What do you understand by friction in impulse turbine. How does it effect the velocity diagram and power output of the turbine.
   b) Discuss the method of velocity compounding of impulse turbine.

2. a) Explain various losses in steam turbine.
   b) What are various methods of governing steam turbine?

3. A reaction turbine with a mean blade diameter of 1m runs at a speed of 50 rev/sec. The blades are designed with exit angles of 50° and inlet angle of 30°. If the turbine is supplied with steam at the rate of 20 lg/sec and gross efficiency is 85%. Determine:
   a) Power output of storage
   b) Specific enthalpy drop in the stage
   c) Percentage increase in relative velocity in the moving blades due to steam expansion.

4. a) What are the advantage of regenerative feed heating cycle over simple Rankine cycle.
   b) Explain the arrangement of a regenerative feed heating cycle with the help of T-s and h-s diagram.

5. A Steam turbine plant equipped with a single regenerative feed heater operates under the following conditions
   Initial steam pressure = 16.5 bar
   Initial Super heat = 93°C
   Extraction pressure = 2 bar
   Exhaust Pressure = 0.05bar
   Compare the regenerative and non regenerative cycle with respect to the following
   a) Thermal Efficiency
   b) Steam consumption in kg per kWh
   c) Condenser duty.

6. a) Discuss the advantage and disadvantage of Reheating in steam power plant.
   b) Draw a schematic diagram of a steam turbine equipped with reheater and regenerative arrangement.

7. Steam enters a turbine employed with reheating arrangement at 90 bar and temperature of 500°C. The steam is reheated at 10.5 bar and exhausts at 0.07 bar. The network developed by the turbine is 1554 kJ/kg. The thermal efficiency is 41% Calculate the temperature of steam coming out of from heater

8. Write short notes on any two :
   a) Closed cycle Gas turbine
   b) Working of Turbo-Jet
   c) Heat Accumulators.

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