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Roll No .....

ME-502 (GS)

B.E. V Semester Examination, June 2020

Grading System (GS)

Turbo Machinery

Time : Three Hours

Maximum Marks : 70

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

1. How the first and second law of thermodynamics applied to understand the basic concepts of Turbo Machines? Apply the steady flow energy equation in compressible and incompressible flow Turbo Machines.

2. The velocity of steam from the nozzles of simple impulse stage of a turbine is 400 m/s. The blade operates close to the maximum efficiency. The nozzle angle is 20°. Considering equiangular blades and neglecting blade friction, calculate for a steam flow of 0.6 kg/s the power and diagram efficiency.

3. In a De-laval turbine, steam issues from the Nozzles with velocity of 1250 m/sec. The nozzle angle is 20° and mean blade velocity is 400m/sec and inlet and outlet angles of the blades are equal. The mass of steam flowing through turbine per hour is 1000 kg. Calculate.
   i) Blade angles
   ii) Relative velocity of steam
   iii) Tangential face on blades
   iv) Power developed
   v) Blade efficiency if blade velocity coefficient is 0.8

4. Define and explain the importance of following terms related to steam turbine.
   a) Speed ratio
   b) Blade velocity coefficient
   c) Diagram efficiency
   d) Stage efficiency

5. The following particulars refers to a stage of a Parsons steam turbine comprising one ring of fixed blades and one ring of moving blades mean diameter of blade ring = 70cm, RPM = 3000 rpm, steam velocity at exit from blades = 160m/s, blade outlet angle = 20°, steam flow through blades = 7kg/s. Draw the velocity diagram and find the following
   i) Blade inlet angle
   ii) Tangential force on the ring of moving blades
   iii) Power developed in a stage

6. Explain:
   i) Nozzle loss
   ii) Disc friction
   iii) Clearance loss

7. Discuss the advantages of centrifugal pump.

   OR

   Define Hydraulic, Volumetric and Overall Efficiency.

8. Write short notes on any two.
   a) Compounding of steam turbine
   b) Reheat factor in turbine
   c) Centrifugal blower

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