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Total number of pages: 11

Total number of questions: 09

B.Tech. -ME/ 3rdSem

Applied Thermodynamics-I

Subject Code: ME-209

Batch: 2004 onwards

May 2018

Reappear

2010 Batch only

Max Marks: 60

Time allowed: 3 Hrs

Important Instructions:

- Section A is compulsory
- Attempt any four questions from section B
- Attempt any two questions from section C

PART A (2×10)

Q. 1. Answer in brief:

- (a) State the advantages of Modern high pressure boilers.
- (b) What do you mean by governing of steam turbines?
- (c) Draw the schematic diagram of combined reheat regenerative cycle
- (d) List the different types of nozzles.
- (e) Draw velocity vector diagram of impulse turbine.
- (f) Define boiler efficiency.
- (g) State the condenser vacuum efficiencies.
- (h) Classify air compressor and enlist its applications in industry.
- (i) State the function of fusible plug.
- (j) What is sensible heating?

PART B (5×4)

- Q. 2. What is the criterion of selecting a boiler? Differentiate between water tube and fire boiler.
- Q. 3. What is the purpose of bleeding steam turbines? Drive the relation for efficiency of regenerative cycle with single feed heater.
- Q. 4. Classify different types of surface condensers.
- Q. 5. Describe the governing of steam turbines. Give different methods for governing in steam turbines.
- Q. 6. In a steam nozzle steam expands from 16 bar to 5 bar with initial temperature of 300°C and mass flow of 1 kg/s. Determine the throat and exit areas considering expansion to be frictionless.

PART C (10×2)

- Q. 7. (a) Explain with the help of neat sketch the working of single stage reciprocating air compressor.
(b) What is the use of intercooler incorporated in reciprocating compressors?
- Q. 8. A single stage of simple impulse turbine produces 150 kW at blade speed of 200 m/s when steam mass flow rate is 3 kg/s. Steam enters moving blade at 400 m/s and leaves the stage axially. Considering velocity coefficient of 0.9 and smooth steam entry without shock into blades, determine the nozzle angle and blade angles. Solve using velocity diagram.
- Q. 9. Write a note on the followings:
 - (i) Mountings and accessories
 - (ii) Losses in steam turbines
 - (iii) Degree of reaction