Department of Mechanical Engineering
Indian Institute of Technology New Delhi
II Semester – 2006 - 2007

JGL 710 POWER PLANT PERFORMANCE ANALYSIS & MONITORING
MAJOR EXAMINATION

Note: Your own hand written notes are allowed.

Time : 2 hrs **Max. Marks: 60**

Question 1 :

Develop a mathematical model to criticise that liquid heating is responsible for low efficiency of Rankine cycle, when compared Carnot Cycle.

5 marks

Question 2 :

Derive an expression for Efficeincy of Rankine cycle with closed feed water heater and prove that there exist an optimum bleed point location for a given turbine inlet condition. Also prove that more the number of CFWHs, more will be the increase in efficiency of the cycle.

15 marks

Question 3a :

Dervie an expression for efficiency of an impulse-reaction turbine stage and prove that increasing degree of reaction leads to an increse in compactness and decrease in stage efficiency.

10 marks

Question 3a :

Also state and discuss three important reasons (**with equations**), for increase in heatrate at lower steam flow rates?

10 marks

Question 4 :

Develop a model (**grphical or mathematical**)to compare the performance of a plant with following partload governing techniques:

1) Throttle Governing. 2) Nozzle Governing. 3) Sliding Pressure Governing.

10 marks

Question 5 :

Discuss the effect of air leakage, cleanliness and inlet cooling water temperature on the performance of a condenser.

10 marks