

كلية الهندسة – قسم الهندسة الميكانيكية

الامتحانات النهائي لمقرر التوربينات البخارية والغازية الزمن: ساعتان ونصف

رقم الجلوس (.....)

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اجب على جميع الأسئلة الأتية ويجب استعمال اللغة الانجليزية.

Q1/)- Draw the velocity steam diagram showing all velocities of steam and directions writing all velocities names and units? (20 marks)

Q2/ What are the most important factors effecting the power generation technology selection (Type of technology)? (10 marks)

Q2/ A gas turbine unit takes in air at 17 C and 1.01 bar and the pressure ratio is 8/1. The compressor is driven by H.P. turbine and the L.P. turbine drives a separate power shaft. The isentropic efficiencies of the compressor, and H.P. and L.P. turbines are 0.8, 0.85and 0.83, respectively. Calculate the pressure and temperature of the gases entering the power turbine, the net power developed by the unit per Kg/s mass flow, the work ratio and the thermal efficiency of the unit. The maximum cycle temperature is 650 C. For the compression process take $C_p=1.005 \text{ KJ/Kg k}$ and $\gamma=1.4$, for the combustion and expansion process take $C_p=1.15 \text{ KJ/Kg K}$ and $\gamma=1.333$. Neglecting the mass of fuel.

Draw the T-S and Block diagrams for the unit (Assume that the H.P. turbine work = the work to drive the compressor). (30 marks)

Good Luck to all