

**Chemical Engineering Department
College of Engineering
King Saud University**

Chemical Engineering Principles (II) - ChE 202

Time : 90 minutes

First test

Date: 10/5/1430

Answer **ALL** questions. **ASSUME** any missing data

Question # 1. (5 marks)

Calculate the specific enthalpy of superheated steam at 3 bar and 520 °C.

Question # 2. (7 marks)

300 kmol/h of saturated steam at 1 bar is mixed with another stream of superheated steam at 500 °C and 1 bar. The stream exiting the mixer is superheated steam at 350 °C and 1 bar. The mixing unit operates adiabatically.

Calculate the required volumetric flow rate of the 500 °C superheated steam.

Question # 3. (8 marks)

200 mol/min of a gas mixture containing 50% hydrogen, 30% carbon monoxide and 20% carbon dioxide is heated from 100 °C to 400 °C. Calculate the required amount of heat. Neglect the kinetic and potential energies.