You are requested to do a preliminary design for the engines for a supersonic "Biz-Jet", which is to cruise at M=2 at 15 km altitude. The aircraft will have a mass of 50,000 kg at end of climb, a lift/drag of 10 and a fuel mass fraction at end of climb of 0.4. It will have 2 engines. Assume Turbojet engines, with a turbine inlet temperature ratio \( \theta_t = 6.5 \). The engines are to be sized to match the cruise flight condition. The compressor pressure ratio is to be selected for maximum thrust/airflow.

Your results should include estimates for the following:

a) The Specific Impulse  
b) The compressor inlet flow area for one engine (assume \( M_2 = 0.5 \))  
c) The maximum cruise range of the aircraft  
d) The thrust/weight ratio of the aircraft at sea-level-static conditions  
e) The compressor pressure ratios at cruise and at takeoff.