1. (70 points) A combined wave-current bottom boundary layer has the following known values:
   • Wave period = 10 seconds
   • Wave amplitude = 0.4 meters
   • Local water depth = 6 meters
   • Current speed = 0.2 m/s measured at \( z_r = 0.7 \) meters
   • Current angle = 10° from wave direction
   • Sediment diameter = 0.15 mm.
   • Flat sea bottom

Determine:
   • The wave, current and combined shear velocities.
   • The critical Shields parameter and critical shear velocity.

2. (30 points) Using the wave quantities of the previous problem, determine the height, length, and movable bed roughness of wave-generated ripples in the field.