

INTRODUCTION TO COASTAL HYDRAULICS

HOMEWORK 2

In assignments, X is the last digit of the student number and Y is the penultimate digit. In the assignments, the student number must be written and $X=?$ and $Y=?$ must be indicated in every solution.

Question 1

A wave with a period of $T=8.X$ sec is propagating from deep water into shallow water. The bottom contours are essentially straight and parallel to the shoreline. Wave approaches the shore with an angle of $\alpha_0=4Y^\circ$ in deep water. Calculate the wave incident angle at a depth of $8.Y$ m.

Question 2

A wave with a period of $8.Y$ s propagates toward the shore from deep water. The wave crests in deep water are oriented at an angle of $4X^\circ$ with the shoreline. Wave height is $4.X$ m at water depth of $2Y$ m. Calculate deep water wave height.

Question 3

A wave having a height of $3.X$ m and a period of $8.Y$ s is propagating toward the shore over a water depth of $3Y$ m. The same wave has an angle of $\alpha_0=6X^\circ$ with shoreline in deep water. Calculate wave parameters in water 10 m deep (H_{10} , L_{10} , α_{10} , $c_{10}=?$).

Question 4

A wave in deep water has the following characteristics: $H_0=4.Y$ m, $T=10.X$ sec (Bathymetry lines are straight and parallel to the shoreline). Calculate breaking wave height, breaking depth and breaking type for the sea bottom slope of $1/50$.

Question 5

A wave with a period of $T=8.X$ sec and a height of $H=3.Y$ m propagates from deep water into shallow water. (Bathymetry lines are straight and parallel to the shoreline, $s=m=1/50$). If the wave incident angle is:

- a) $\alpha=3Y^\circ$
- b) $\alpha=4X^\circ$

Determine the breaking wave height, breaking depth and breaking type.

Question 6

A wave having a period of $9.Y$ s breaks with an approaching angle of $2X^\circ$ and a height of $H_b=4.Y$ m. Determine the breaking depth and the deep water wave height ($s=m=0.03$).