班級：______________學號：______________姓名：______________

國立台灣海洋大學河海工程研究所 BEM 2006 第 3 次作業

1. In the course, we have derived the fundamental solution of

$$\frac{d^2U(x,s)}{dx^2} - q^2U(x,s) = \delta(x-s), \quad -\infty < x < \infty$$

by using Fourier transform, inverse Fourier transform, residue theorem, and limiting process of $q \to 0$.

Please extend the second order ODE to fourth order ODE.

$$\frac{d^4U(x,s)}{dx^4} + q^4U(x,s) = \delta(x-s), \quad -\infty < x < \infty$$

(1). Is *U(x,s)* ***singular ?***

(2). Is *U(x,s) symmetric ?*

(3). Is *U(x,s) degenerate form ?*

2. In the course, we have derived the Green's function of finite region with fixed ends $\frac{d^2G(x,s)}{dx^2} = \delta(x-s), \quad 0 < x < L$

subject to *G(0,s)=G(L,s)=0*

Please extend to the case of cantilever rod, i.e., .

(a). *G(L,s)=0,* $\frac{dG(x,s)}{dx}\Big|_{x=0} = 0,$ for odd number student

(b). *G(0,s)=0,* $\frac{dG(x,s)}{dx}\Big|_{x=L} = 0,$ for even number student

(1). Is *G(x,s)* ***singular ?***

(2). Is *G(x,s) symmetric ?*

(3). Is *G(x,s) degenerate form ?*