King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math-513 Semester-142 QUIZ I

NAME: S.No. ID:

Maximum Marks: 20 Section: Time Allowed: 45 minutes

(1) Show that the Fourier transform of

$$f(t) = \begin{cases} 1 - (\frac{t}{a})^2 & |t| \leq a \\ 0 & |t| \geq a \end{cases}$$

is $F(w) = \frac{4sin(wa)}{a^2w^3} - \frac{4cos(wa)}{aw^2}$.

(2) Find the Fourier transform of $\frac{\cos(at)}{1+t^2}$, where a is real, given that $F(\frac{1}{1+t^2}) = \pi e^{-|w|}$

(3) Find the particular solution of the following differential by Fourier transform :

$$y'' + 4y' + 4y = e^{-|t|}$$