King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Math 202 **Section ......** **Serial #: ....** **Quiz 3(a) (Term 172)**

Name : .... **ID** #...................................... **Marks** #: ..../8

1. Show that $y_1 = \sin x$ and $y_2 = \cos x$ form a fundamental set of solutions for the differential equation $y'' + y = 0$ on $(-\infty, \infty)$.

2. If $y_1 = e^x$ is a solution of the associated homogeneous equation of $y'' - 3y' + 2y = 5e^{3x}$, then find its second solution y_2 and the general solution of this equation.

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Math 202 **Section ......** **Serial #: ....** **Quiz 3(b) (Term 172)**

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1. Check whether or not the following BVP has a solution.

$$y'' + 4y = 0, \quad y(0) = 0, \quad y(\pi) = 1.$$

2. If one of the solutions of $xy'' - y' + 4x^3y = 0$ is $y_1(x) = \sin(x^2)$, then find its other solution $y_2(x)$. Calculate value of its general solution $y(x)$ at $x = 0$.

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Math 202 **Section ......** **Serial #: ....** **Quiz 3(c) (Term 172)**

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1. Solve $y''' + 4y'' + 5y' + 6y = 0$

2. $y_1 = x^2$ is a solution of $x^2y'' - 3xy' + 4y = 0$. Find the general solution of this equation on $(0, \infty)$.

3. Find a homogeneous linear differential equation of smallest order for which the fundamental set of solutions is $\{1, x, e^{-3x},\ e^{2x} \cos 5x,\ e^{2x} \sin 5x\}$.