



Philadelphia University
Department of Basic Sciences and Mathematics



Academic Year:	2017–2018	Course Name:	ODEs
Semester:	Second Semester	Course Number:	250203
Exam:	Second Exam	Instructor Name:	Feras Awad
Exam Date:	03/05/2018	Student Name:	_____
Exam Day:	Thursday	University ID:	_____
Mark:	[20]	Section:	[1]

Question ONE : (10 points) Write the symbol of the correct answer in the blank.

1. $\left[\quad \right]$ Let L be a differential operator defined by $L[y] := (D^2 - xD + 2)[y]$. Then $L[x^2]$ equals

(A) $2 - 2x^2$ (B) 2 (C) $2 - x^2$ (D) $2x$
2. $\left[\quad \right]$ Which one of the following is a form of the particular solution of the linear 2nd order differential equation $y'' - 4y' + 4y = xe^{2x}$?

(A) Axe^{2x} (B) $x^2e^{2x}(Ax + B)$
(C) $xe^{2x}(Ax + B)$ (D) Ax^2e^{2x}
3. $\left[\quad \right]$ The differential operator that annihilates the function $xe^{-2x} + xe^{-5x} \sin 3x$ is

(A) $(D + 2)^2 [(D + 5)^2 + 9]^2$ (B) $(D + 2)^2 [(D + 3)^2 + 25]^2$
(C) $(D + 2)^2 [(D + 3)^2 + 9]^2$ (D) $(D + 2)^2 [(D + 5)^2 + 9]$
4. $\left[\quad \right]$ Which of the following sets of functions are linearly independent on $(0, \infty)$?

(A) $\{1, \sin^2 x, \cos^2 x\}$ (B) $\{1, x + 3, 2x\}$
(C) $\{x, \ln x, 3\}$ (D) None
5. $\left[\quad \right]$ If the fundamental solutions of the equation $y'' + ay' + by = 0$ are $y_1 = e^{2x}$ and $y_2 = e^{-3x}$, then

(A) $a = -5, b = 6$ (B) $a = 5, b = 6$
(C) $a = -1, b = -6$ (D) $a = 1, b = -6$

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