Prince Sultan University

Deanship of Educational Services
Department of Mathematics
and General Sciences



COURSE DETAILS:

DIFFERENTIAL EQUATIONS		MATH 225	MAJOR EXAM I
Semester:	Fall 2018-2019Term 181		
Date:	Saturday October 13, 201	8	
Time Allowed:	80 minutes		

STUDENT DETAILS:

Student Name:		
Student ID Number:		
Section:	93	95
Instructor's Name:	J. Alzabut	

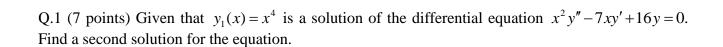
INSTRUCTIONS:

- You may use a scientific calculator that does not have programming or graphing capabilities. NO borrowing calculators.
- NO talking or looking around during the examination.
- NO mobile phones. If your mobile is seen or heard, your exam will be taken immediately.
- Show all your work and be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.

GRADING:

	Page 1	Page 2	Page 3	Total
Questions	1,2	3,4	5,6	
Marks	14	11	15	40

20



Q.2 (7 points) Solve the following differential equation $y''' - 6y'' = 3 - \cos x$ by method of undetermined coefficients. Evaluate the constants of Y_p .

Q.3 (6 points) Solve the equation $y' - (1+2x)y^2 = 0$, y(0) = 5.

Q.4 (5 points) Consider the equation y'' + 9y = 0.

- a) Verify that the functions $y_1(t) = \cos(3t)$ and $y_2(t) = \sin(3t)$ are solutions of the equation.
- b) Do these functions form a fundamental set of solutions for the equation. Explain your answer.

					•			
0.5(7)	noints)	Solve	the equati	on $(2v)$	$^{2} + 3x$	dx + (2x)	(v)dv = 0).

Q.6 (8) Solve the differential equation $xy' - (1+x)y = xy^2$ by appropriate substitution.