

**MATH 202-Exam 1- Term 211**

Duration : 90 Minutes

Code 001

Name: Key

ID Number: \_\_\_\_\_

Section Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Class Time: \_\_\_\_\_

Instructor`s Name: \_\_\_\_\_

Instructions:

1. Calculators and Mobile Phones are not allowed.
2. Write Legibly. You may lose points for messy work.
3. Make sure that you have 8 pages of problems (Total of 11 Problems)  
(There are 7 multiple choice and 4 written questions).
4. For the written questions, you need to show all your work. No points for answer without justifications.

Question number	Answer	Maximum Points	Points
1	e	5	
2	b	5	
3	d	5	
4	d	5	
5	c	5	
6	b	5	
7	e	5	
<b>Total</b>		<b>35</b>	

Written

Question number	Points	Maximum Points
8		10
9		10
10		10
11		10
<b>Total</b>		<b>40</b>

75

1. The **sum** of all values of  $m$  such that  $y = e^{mx}$  is a solution of the DE

$$y'' - 6y' - 7y = 0$$

is

$$\text{let } y = e^{mx} \Rightarrow y' = m e^{mx} \Rightarrow y'' = m^2 e^{mx}$$

substituting in the DE, we get

$$m^2 e^{mx} - 6m e^{mx} - 7e^{mx} = 0 \Rightarrow$$

$$e^{mx} (m^2 - 6m - 7) = 0 \Rightarrow e^{mx} (m-7)(m+1) = 0$$

$$e^{mx} \neq 0 \text{ so } (m-7)(m+1) = 0 \Rightarrow m=7 \text{ or } m=-1$$

- a) 0  
b) 4  
c) 5  
d) 2  
 e) 6

2. The **sum** of all constant solutions of the DE

$$\text{Sum} = 7 - 1 = 6$$

$$x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} + y^2 = 4$$

is

let  $y = k$  where  $k$  is constant

$$y' = 0, y'' = 0.$$

$$\therefore k^2 = 4 \text{ or } k = \pm 2.$$

$$\text{Sum} = -2 + 2 = 0$$

- a) 4  
 b) 0  
c) 2  
d) -2  
e) 6