

Course No: SWEN 2308  
Course Title: Descartes Mathematics

University of Palestine



Second Midterm Exam  
2<sup>nd</sup> Semester 2016/2017

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**ANSWER ALL QUESTIONS**

**QUESTION 1: State whether of the following statements is true or false: (4 Marks)**

1.  $2 \in \{1, 2, 3, 4, 5\}$

2.  $\{2\} \in \{1, 2, 3, 4, 5\}$

3.  $2 \subseteq \{1, 2, 3, 4, 5\}$

4.  $\{2\} \subseteq \{1, 2, 3, 4, 5\}$

5.  $\emptyset \subseteq \{\emptyset, \{\emptyset\}\}$

6.  $\{\emptyset\} \subseteq \{\emptyset, \{\emptyset\}\}$

7.  $0 \in \emptyset$

8.  $\{1, 2, 3, 4, 5\} = \{5, 4, 3, 2, 1\}$

**QUESTION 2: Use Direct Proof to prove that, for every integer n, if n is even, then  $n^2$  is even. (2 Marks)**

**QUESTION 3: Prove that, if n and m are integers and 3 is a factor of both n and m, then 3 is a factor of any number of the form  $nx + my$  where x and y are integers. (2 Marks)**

**QUESTION 4:** Show that  $\{x : 2x^2 + 5x - 3 = 0\} \subseteq \{x : 2x^2 + 7x + 2 = 3/x\}$ . (2 Marks)

**QUESTION 5:** By Contrapositive prove that, if  $n$  is an integer,  $n^2$  is odd if and only if  $n$  is odd. (2 Marks)

**QUESTION 6:** Let the universal set is  $U = \{a, b, c, d, e, f, g\}$  and let  $A = \{a, c, e, g\}$  and  $B = \{d, e, f, g\}$ . Find  $A \cup B$ ,  $A \cap B$ , and  $B - A$ . (1 1/2 Marks)

**QUESTION 7:** Find the power set of the set  $\{x, y\}$ . That is, find  $P(\{x, y\})$ . (1 1/2 Marks).

===== BEST WISHES =====