King Saud University
Science and Medical Studies Section for girls
College of Science
Department of Mathematics

Math151
First Term 1432-33
First midterm Exam
90 minuets

Name:	Student No.:
Section No.:	Sequence No.:

Question No.	I	II	III	IV	Total
Mark					

Question I

Choose the correct answers and write them in the following table:

Question	1	2	3	4	5	6	7	8	9	10
Answer										

1) The compound proposition $[p \wedge (\neg p \rightarrow q)] \rightarrow \neg p$ is
a) a tautology b) a contradiction c) a contingency

2) The proposition $(p \wedge q) \rightarrow p$ and its inverse are logically equivalent
a) $true$ b) $false$

3) Let $x \in \mathbb{Z}$. The two statements "If x is even, then $x^2 \geq 1$" and "If $x^2 < 1$, then x is odd" are
a) logically equivalent b) not logically equivalent

4) The argument $\{p \rightarrow q, q \rightarrow (p \rightarrow r), p \therefore r\}$ is
a) valid b) invalid

5) The statement $(\exists n \in \mathbb{N})$ such that $n + 2 = 3n$ is
a) true b) false

6) The statement $\{1\} \subseteq \mathcal{P}(\{1, 2\})$ is
a) true b) false

7) Let P(x,y) be the statement "$x = 3y + 6$" then
a) P(1,6) is true b) P(9,1) is true c) P(1,9) is true

8)"$|x-1| > 1$" is a proposition
a) true b) false

9) If a statement is not a tautology then it is a contradiction
a)true b) false

10) The statement : $A \subseteq B \Leftrightarrow A \cup B = A$, where A and B are subsets of a certain set
a) true b)false

Question II

a) Write the contrapositive and the converse of the following
You will win if you try hard.

1-

2-

b) Prove that $x \geq -|x|$ where x is a real number.

Question III

Let $n \in \mathbb{N}$. Prove that $5n + 6$ is even if and only if n is even.

Question IV

Using the first principle of mathematical induction to prove

$1 + 3 + \cdots \ldots \ldots \ldots \ldots \ldots + (2n - 1) = n^2 \; for \; n \geq 1.$

Good Luck