



Bahria University, Islamabad Campus  
Department of Computer Science  
Quiz # 1  
Class: BSIT-2A  
(Fall 2019 Semester)

Date: 03/10/2019

Course: Discrete Mathematics

Total Marks: 10

Time Allowed: 20 mins

Name: \_\_\_\_\_

Enrolment #: \_\_\_\_\_

1. What is proposition? Are the following propositions? If yes then determine whether proposition is true or false? (3)

- a.  $x+4 > 9$
- b. Can Ali come with you?
- c. Islamabad is the capital of Pakistan.

Proposition is a statement there is either true or false

a. It is true for some values of  $x$  and false for other values so it is not a proposition.

b. It is a question not the declarative sentence and not a proposition.

c. This is a declarative statement, hence is a proposition and it is true.

2. Verify the logical equivalences and supply a reason for each step. (3.5)

$$\sim(p \vee \sim q) \vee (\sim p \wedge \sim q) \equiv \sim p$$

$$\begin{aligned} &= (\sim p \wedge \sim(\sim q)) \vee (\sim p \wedge \sim q) && \text{De Morgan law} \\ &\equiv (\sim p \wedge q) \vee (\sim p \wedge \sim q) && \text{Double negation law} \\ &\equiv \sim p \wedge (q \vee \sim q) && \text{Distribution law} \\ &\equiv \sim p \wedge t && \text{Negation law} \\ &\equiv \sim p && \text{Identity law} \end{aligned}$$

(3.5)

3. Determine whether the given argument is valid or invalid

$$p \vee (q \wedge r)$$

$$\sim p$$

$$\therefore q \wedge r$$

p	q	r	$p \vee (q \wedge r)$	$\sim p$	$q \wedge r$
T	T	T	T	F	T
T	T	F	F	F	F
T	F	T	F	F	F
T	F	F	T	F	F
F	T	T	T	T	T
F	T	F	F	T	F
F	F	T	F	T	F
F	F	F	F	T	F

Valid Argument -