



ALPHA KERANYO PRIMARY, SECONDARY & PREPARATORY SCHOOL

Full Name _____ Grade 11 Section _____ Roll No. _____
 Subject: Maths Year: 2012 E.C. SECOND Semester ASSIGNMENT
 Assignment should be submitted individually in hard copy Submission date : on the day school reopen
 Teacher's Name : A.D. Total Mark: 10

i. CHOOSE THE BEST ANSWER FROM THE GIVEN ALTERNATIVE (0.5 POINT EACH)

1. Suppose $e(x) \equiv x$ is even; $p(x) \equiv x$ is prime; $d(x) \equiv x$ is divisible by 2. Which one of the following has the truth value FALSE on the set of natural numbers?

A. $(\exists x)[e(x) \wedge p(x)]$

C. $(\exists x)[e(x) \wedge \neg d(x)]$

B. $(\forall x)[e(x) \Rightarrow d(x)]$

D. $(\forall x)[e(x) \vee \neg d(x)]$

2. Consider the following argument form. Production is high if rain continues. Rain does not continue. Therefore, either production is low or rain continues

Let P: production is low q: rain continues. The following table is also given about p and q.

Rows	p	q	$\neg p$	$\neg q$	$\neg p \Rightarrow q$	$q \Rightarrow \neg p$	$p \vee q$
1	T	T	F	F	T	F	T
2	T	F	F	T	T	T	T
3	F	T	T	F	T	T	T
4	F	F	T	T	F	T	F

Which of the following is necessarily true?

A. The argument form is valid due to row 2.

C. The argument form is valid due to rows 2 and 3.

B. The argument form is invalid due to row 4.

D. The argument form is invalid due to rows 1 and 3

3. Let p, q and r be propositions such that $p \Rightarrow (r \vee \neg q)$ is false. Which one of the following is true?

A. $p \Rightarrow r$

B. $\neg r \Rightarrow q$

C. $\neg p \Leftrightarrow q$

D. $q \Leftrightarrow r$

4. For real numbers x and y, which one of the following statements is true?

A. $(\forall x)(\exists y)(x^2 + y + 1 = 0)$

C. $(\exists x)(\forall y)(x^2 + y + 1 = 0)$

B. $(\exists y)(\forall x)(x^2 + y + 1 = 0)$

D. $(\forall y)(\exists x)(x^2 + y + 1 = 0)$

5. Consider the following argument:

"If he does not love her, she will not marry him. He loves her. Therefore, she will marry him."

If 'p $\equiv$ He loves her' and 'q $\equiv$ she will marry him,' which one of the following is the correct representation of the argument and its validity?

A. $\neg p \Rightarrow \neg q, p \mid q$; valid argument

C. $\neg p \Rightarrow \neg q, p \mid q$; Invalid argument

B. $p \Rightarrow q, p \mid q$; valid argument

D. $p \Rightarrow q, p \mid q$; Invalid argument

6. Suppose the following statements are the premises of an argument. "He was lazy or he did not like the classroom. If he was lazy, he could not pass the exam. He passed the exam." Which one of the following can be a conclusion that makes the argument valid?

- A. He did like the classroom
 B. He did not like the classroom.
 C. If he was not lazy, he did like the classroom
 D. He was not lazy and he did like the classroom

7. Which of the following is not true on the set of whole numbers?

- A. $(\exists x)(\forall y)(x \leq y)$
 B. $(\exists x)(\exists y)(x^2 + 1 < y)$
 C. $(\forall x)(\forall y)(x^2 - y^2 \geq 0)$
 D. $(\forall x)(\exists y)(x < y^2)$

8. For statement P, of and r, which of the following is NOT true?

- A. $(P \wedge q) \Leftrightarrow (\neg P \vee \neg q)$ is contradiction
 B. $P \Rightarrow (q \wedge r) \equiv (P \Rightarrow q) \wedge (P \Rightarrow r)$
 C. $[(P \wedge q)] \vee (\neg r \Rightarrow q) \Leftrightarrow \neg P$ is always TRUE if P is FALSE
 D. If $P \wedge q$ is True, then $[(P \wedge q)[Vr] \Rightarrow \neg P$

9. Which of the following statement has a truth value "True"?

- A. $(\forall x)(x^2 + 1 > 1)$
 B. $(\exists x)(x + 2 = x + 3)$
 C. $(\exists x)(\sqrt{(x + 4)^2} = x + 4)$
 D. $(\forall x)(x^2 = 4x)$

10. Let p and q stand for the statements "Nejat is intelligent" and "Almaz is hardworking" Almaz is hard working if Nejat is intelligent"?

- A. $\neg p \wedge q$
 B. $\neg p \vee q$
 C. $p \wedge q$
 D. $\neg q \vee p$

II. SHORT ANSWER: WRITE YOUR ANSWER ONLY(1 POINT EACH)

11. If $\frac{(x-1)^2}{16} + \frac{(y+1)^2}{9} = 1$ is an Ellipse, then find the following

- A. Focus-----
 B. eccentricity-----
 C. vertices-----

III. WORK OUT :SHOW YOUR STEP CLEARLY(1 POINT EACH)

12. Find the angle between the lines $l_1: x - \sqrt{3}y + 1 = 0$ and $l_2: \sqrt{3}x + y - 3 = 0$ (assume θ is angle between l_1 and l_2 and formed from l_1 to l_2)

13. Find the equation of the line tangent to the circle $x^2 + (y - 3)^2 = 10$ at the point (1,0) ?

14. The curve $4x^2 - 9y^2 - 16x - 18y = 29$ represents(circle or ellipse or parabola or hyperbola) explain :

15. Find equation of the hyperbola having focus on a line parallel to the x - axis. Length of lotus rectum 4 units and asymptotes defined by $x - y = 1$ and $x + y = 3$