

2014 FRESH HANDOUTS

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# Asosa University

## College of natural and computational science

### Department of mathematics

**Basic Mathematics for Social Science ( Math 1011) Mid-Exam For 1st year 1st Semester Fresh Man Students (Maximum point 30%)**

Time allowed: 2:00hrs.

Name:_____ ID, NO _____ Section _____

I. **Choose the best answer from the given alternatives (each 1.5 pts)**

_____ 1. Which of the following sentences are not proposition in mathematics?

A) 4 is even integer B) 3 is less than 2 C) God bless you D) [illegible] is in Africa

_____ 2. Let P: $\sqrt{2}$ is an irrational number, q: 2 is an odd number. Then which of the following compound proposition has truth value true? A) $\neg p \vee q$ B) [illegible] C) $\neg q \Leftrightarrow p$ D) $p \wedge q$

_____ 3. If p, q and r are proposition such that $(p \Leftrightarrow r) = (\neg q \Leftrightarrow r)$ has truth value false, then which of the following have truth value false? A) $\neg r$ B) $q$ C) $\neg r$ D) $p \vee q$

_____ 4. *Let* $P(x): x^2 + x > 0$. *Then* $\neg(\exists x)p(x)$ *is:*

A) $(\exists x)(x^2 + x > 0)$ B) $(\exists x)(x^2 + x$ [illegible] $(\forall x)(x^2 + x < 0)$ D) $(\forall x)(x^2 + x \leq 0)$

_____ 5. Which one of the following function is one-to-one correspondence?

A. $f: \mathbb{R} \to [0, \infty)$ defined by $f(x) = x^2$ B. $f: [0, \infty) \to \mathbb{R}$ defined by $f(x) = |x|$

C. $f: [0, \infty) \to [0, \infty)$ defined by $f(x) = x^2$ D. $f: \mathbb{Z} \to \mathbb{Z}$ defined by $f(x) = 2x$

_____ 6. Which of the following is a set? A) {1,2},3 B) {1,{2},3} C) {1,{2}},3 D) 1,2,3

_____ 7. What is the power set of {ab}?

A) {} B) $\{\emptyset, \{a\}, \{b\}\}$ C) $\{\emptyset, \{ab\}\}$ D) $\{\{ab\}\}$

_____ 8. How many elements a set A contain if it has 63 proper subsets? A) 6 B) 8 C) 7 D) 5

_____ 9. *If* $B \subseteq A$, $A \cap B = \{1,4,5\}$ *and* $A \cup B = \{1,2,3,4,5,6\}$, *then set B is:*

A. {1,4,5} B) {2,3,6} C) {1,2,3,4,5,6} D) {2,4,6}

_____ 10. If $C = \{1,2,3,4,5,6,7,8\}$ *and* $D = \{2,3,5,7,8,9\}$, *then* $C - D$ *is:*

A. {1, 4, 6} B) {7, 9} C) {1, 3, 5, 7} D) {2, 4, 6, 8}

_____ 11. Which one of the following statement is not true?

A. $(\exists x \in \mathbb{R})(x^2 - x = 0)$ B. $(\forall x \in \mathbb{R})(\exists y \in \mathbb{R})(x + y = 5)$

C. $(\forall x \in \mathbb{N})(x + 1 \geq 2)$ D. $(\exists x \in \mathbb{R})(\forall y \in \mathbb{R})(x + y = 5)$

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12. Which one of the following is a contra positive of the statement: **If it rains, then Tigist does not take a walk?**

A. If it does not rain, then Tigist take a walk

B. If Tigist takes a walk, then it does not rain.

C. If Tigist does not take a walk, then it rains.

D. If Tigist takes a walk, then it rains.

**II-Fill in the blank Space**

13. *Let* $R=\{(x,y):|x|+y\leq 2\}$ be a relation, then

a) Dom(R)=_____ (2pts)

b) range of R is _____ (1pt)

14. *Let* $f(x)=2x+1$ *and* $(fog)(x)=3x-1$, *then* $g(x)=$_____ (1pt)

**III-Work out (show clearly the necessary steps)**

15. Find the solution sets of the following

a) $5x-2<3x-\left(x-\frac{1}{5}\right), x\in N$ (3 pts)

b) $\frac{1}{2}x^2+\frac{25}{2}\geq 5x, if\ x\in\Re$ (3 pts)

16. Check the validity of $\neg q\Rightarrow\neg p, r\Rightarrow p, \neg q\vdash r$ by using truth table (3p

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