INTERNATIONAL PROGRAM ON SCIENCE EDUCATION (IPSE)
FACULTY OF MATHEMATICS AND SCIENCE EDUCATION
INDONESIA UNIVERSITY OF EDUCATION

QUIZ OF FIRST SEMESTER OF YEAR 2013/2014

UNIT : BASIC MATHEMATICS
DURATION : 90 MINUTES

Direction:
Select the appropriate answer by assigning check (V) on the corresponding letter. Use the provided answer sheet.

1. Which one is an example of a set?
   a. A group of delicious food in a wedding party.
   b. A collection of long-haired male students in your class.
   c. A collection of beautiful scenery in West Papua.
   d. A group of beautiful ladies in a talk show.
   e. A group of 2-year old mathematics professors.

2. Which one is an empty set?
   a. A set of odd numbers divisible by 9.
   b. A set of even natural numbers.
   c. A set of prime-odd numbers.
   d. A set of integers greater than -3 but less than 2.
   e. A set of odd numbers x where $x=(2n\text{-}1)^2$, and n is a natural number.

3. The following sets which can be classified as a finite set is
   a. $A = \{1,2,3, \dots , 1000\}$
   b. $B = \{x \mid x = 2n\text{-}1, n \text{ is a natural number}\}$.
   c. $C = \{x \mid x = n^3, n \text{ is a natural number}\}$.
   d. $D = \{x \mid x = (2n\text{-}1)^2 \text{ where } n \text{ is an odd number}\}$.
   e. $E = \{x \mid x \text{ is a prime number greater than } 9\}$.

4. Which set can be categorized as a bounded set?
   a. $A = \{1,3, 5, \dots \}$
   b. $B = \{x \mid x = 2n - \frac{1}{n}, n \text{ is a natural number}\}$.
   c. $C = \{x \mid x = n^3+2n+1, n \text{ is a whole number}\}$.
   d. $D = \{1, \frac{1}{3}, \frac{1}{3^2}, \frac{1}{3^3}, \square \}$.
   e. $E = \{x \mid x \text{ are real numbers greater than 0 but less than } 9\}$.

5. The following sets which *cannot* be classified as a bounded set is
   a. $A = \{1,3, 5, \dots , 1001\}$.
   b. $B = \{x \mid x = n^2 - 6n + 1, n \text{ is a natural number greater than } 3\}$.
   c. $C = \{x \mid x = \frac{2n-1}{3n+n^2}, n \text{ is a natural number greater than } 2\}$.
   d. $D = \{x \mid x = \frac{2}{3n+1}, n \text{ is a natural number greater than } 1\}$
   e. $E = \{x \mid x \text{ is real numbers less than 2 but greater than } 1\}$.

6. Which pair of equal sets in the following information?
   $A = \{x \mid x$ is a letter which constructs the word "massachussets"$\}$.
   $B = \{x \mid x$ is a letter which constructs the word "machs"$\}$.
   $C = \{x \mid x$ is a letter which constructs the word "smashcute"$\}$.
   $D = \{x \mid x$ is a letter which constructs the word "chesstuma"$\}$.
   a. A and D. b. B and C. c. C and D. d. B and D. e. A and D.

7. Which statement is correct?
   a. If x and y are odd numbers and $x > y$, then $(x-y)^2 + (x+y)^2$ is an odd number.
   b. If x and y are even numbers and $x > y$, then $2(xy)^2 + x^2 y$ is an odd number.
   c. If x and y are integers, then $2(x-y) + 2(y-x)^2$ is not an integer.
   d. If x and y are real numbers, then $2\sqrt{(x-y)} + \sqrt{3(y-2x)}$ is a real number.
   e. If x and y are natural numbers, then $2(x-y)^2 + (y-x)^2$ is a natural number.

8. The incorrect statement in the following set of statements is
   a. The set of rhombuses is a subset of the set of kites.
   b. The set of rectangles is a subset of the set of parallelograms.
   c. The set of squares is a subset of the set of parallelogram.
   d. The set of squares is a subset of the set of trapezoids.
   e. The set of kites is a subset of the set of squares.

9. Which one is correct?
   a. A rhombus is quadrilateral and a trapezoid is a pentagon.
   b. A rectangle is a parallelogram and a square is a rhombus.
   c. A parallelogram is a square and a square is a rhombus.
   d. A square is a trapezoid and a trapezoid is a rectangle.
   e. A kite is a square and a square is a rectangle.

10. Let A be a set of squares, B be a set of parallelograms, and C be a set of rhombuses. Then
    a. $A \cup (B \cap C) = B$. b. $A \cap (B \cup C) =$ A. c. $B \subset (A \cup C)$.
    d. $(B \cup C) \subset$ A. e. $(A \cap B) \cup (B \cap C) = B$.

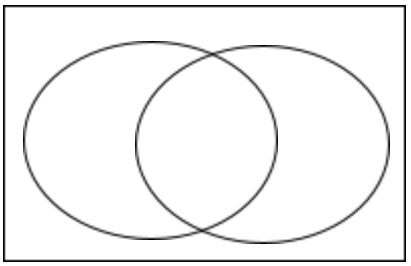
11. If A, B and C are sets, which statement is incorrect?
    a. If $A \subset B$, then $A \cap B = A$.
    b. If $A \subset B$, $B \subset C$, then $A \subset C$.
    c. If $A \cap B = A$, then $A \cup B = B$.
    d. If $A \cup B = B$, then $B - A = B \cap A'$.
e. If $A \subset B$, and $B \not\subset C$, then $A \cap C = \varnothing$.

12. Let A be a non empty set. Then
    a. $A \in 2^A$. b. $A \subset 2^A$. c. $\{A\} \not\subset 2^A$. d. $\{A\} \notin 2^A$. e. $A \notin 2^A$.

13. Which statement is correct?
    a. $\{2\} \in \{\{2\}\}$. b. $\{3\} \subset \{\{3\}\}$. c. $\varnothing \notin \{4\}$. d. $\varnothing \subset \{\ \}$. e. $\{2,3\} \not\subset \{3,2\}$.

14. Suppose A and B are the sets of natural numbers. The only correct statement is
    a. If $A \subset B$, then $A = B$.
    b. If $B \subset A$, then $B = A$.
    c. If $A \neq B$, then $A \subset B$.
    d. If $B \neq A$, then $B \subset A$.
    e. If $A = B$, then $A \subset B$ and B $\subset A$.

15. Consider the following figure.



Which one satisfies the above condition?

a. $A \cap B = \{2,3,4\}$. b. $A \cap B' = \{5\}$. c. $B \cup A' = \{2,4,5\}$. d. $(A \cup B) \cap A = (2\}$.

16. Given that A, B, C are sets and S is a universal set.

If $A = \{x \mid x = 2n\text{-}1, n \text{ is a natural number}\}$

$B = \{x \mid x = 2n, n \text{ is a natural number}\}$.

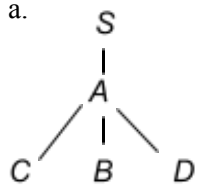
$C = \{x \mid x = 2n^2, n \text{ is a natural number}\}$.

$D = \{x \mid x\,(x-1)(x-2) = 0, x \text{ is a natural number}\}$

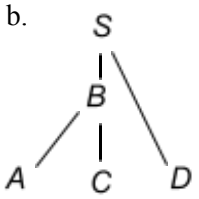
$S = \{x \mid x \text{ is an integer}\}$.

The above sets can be represented by the following line diagram:

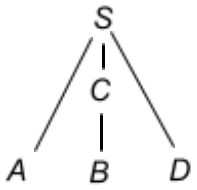
a.



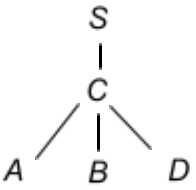
b.



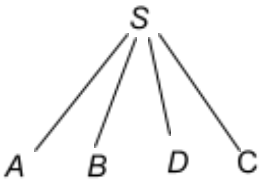
c.



d.



e.



17. If A, B, and C are sets, then the **incorrect** statement is

a. $(A \cup B) \cap (A \cup B') = A$.

b. If $A \subset B$ and $B \subset C$, then $A \subset C$.

c. If $A \cup B = S$ then $A' \subset B$.

d. $(A \cap B) \cup (A \cap B') = A$.

e. $A \cap (A \cup B) = B$.

18. Define $a * b = 2a + b - 2ab$. Then the value of $3 * 2$ is

a. 4. b. 2. c. 0. d. -2. e. – 4.

19. Let A be the set of integers. The identity element of A under multiplication operation is

a. -1. b. 0. c. 1. d. 2. e. 3.

20. Let B be the set of natural numbers. The identity element of B under addition operation is

a. -1. b. 0. c. 1. d. 2. e. not available.

21. Let K be the set of integers. The additive inverse of x in the set K is

a. $-x$. b. 0. c. $2x$. d. $\frac{1}{x}$. e. $-2x$.

22. Suppose that a and b are the element of the set of integers A and $a * b = a + b - 2ab$. The identity element under this operation is

a. $-a$. b. 0. c. a. d. $-b$. e. b.

23. The inverse element of a under the operation defined in question number 22 (above) is

a. $\frac{1}{2a}$. b. $\frac{a}{1-a}$. c. $\frac{a}{2a-1}$. d. $-\frac{-a}{1-a}$. e. $\frac{2a}{a-1}$.

24. Suppose that a and b are the element of the set of integers A and $a * b = a + b + 1$. The identity element under this operation is

a. $-a$. b. 0. c. a. d. $-b$. e. b.

The solution set for the inequality $|x-2|<1$ is

a. $\{x|-1<x<3\}$. b. $\{x|x< -2\}$. c. $\{x|x>1\}$. d. $\{x|1<x<3\}$. e. $\{x|x<3\}$

25. The solution set for $x^2 - 4 < 0, x \in R$ is

a. $\{x|-2< x< -2\}$. b. $\{x|-4< x< 4\}$. c. $\{x|x<-2 \text{ or } x>2\}$.
d. $\{x|x<4 \text{ or } x>-4\}$. e. $\{x|x<2 \text{ or } x>4\}$.

26. The solution set for the inequality $|x^2 + 5x| \leq 6$ is

a. $\{x \mid -5 \leq x \leq 1\}$. b. $\{x \mid -3 \leq x \leq 2\}$. c. $\{x \mid -6 \leq x \leq -3 \text{ or } -2 \leq x \leq 1\}$.
d. $\{x \mid -6 \leq x \leq -5 \text{ or } 0 \leq x \leq 1\}$. e. $\{x \mid -5 \leq x \leq -3 \text{ or } -2 \leq x \leq 1\}$.

Answer:

NO	A	B	C	D	E
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

NO	A	B	C	D	E
1					
2					
3					
4					

5					
6					
7					
8					
9					
10					
11					
12					
13					

Name:
NIM:

Signature: