

King Fahd University of Petroleum and Minerals  
Math001- CLASS TEST # 1

Name: \_\_\_\_\_ ID#: \_\_\_\_\_ Sec#: \_\_\_\_\_

**PART I : MULTIPLE CHOICE QUESTIONS**

1. Which one of the following statements is TRUE?
  - (a) All integers are natural numbers.
  - (b)  $\frac{a}{b}$  is the multiplicative inverse of  $\frac{b}{a}$ .
  - (c)  $8(gh+5) = 8(hg+5)$  is true because of the commutative property of multiplication.
  - (d)  $\pi = \frac{22}{7}$ .
  - (e) If  $a - b = 7$ , then  $7 = b - a$ .
  
2. Which one of the following statements is FALSE?
  - (a) The sum of two composite numbers is a composite number.
  - (b) Every real number is either a rational or irrational.
  - (c) Every nonnegative integer number is either even or odd.
  - (d) 1 is the only positive integer that is not prime and not composite.
  - (e) The irrational numbers is not closed under addition.
  
3. Which one of the following statements is TRUE?
  - (a)  $|y| = y$  for any real number  $y$ .
  - (b)  $|-y| = y$  for any real number  $y$ .
  - (c)  $d(m, m) = 0$  for any real number  $m$ .
  - (d)  $d(m, n) = -d(n, m)$  for all real numbers  $m$  and  $n$ .
  - (e)  $|x|$  is a positive number.
  
4. The interval  $(-\infty, 0] \cap (-2, \infty)$  can be written as:
  - (a)  $[-2, 0]$ .
  - (b)  $-2 \leq x \leq 0$ .
  - (c)  $0 \leq x < 2$ .
  - (d)  $-2 < x < 0$ .
  - (e)  $-2 < x \leq 0$ .

5. The number  $980.665 \times 10^{-2}$  written in scientific notation is :

- (a)  $0.980665 \times 10$ .
- (b)  $0.0980665 \times 10^2$ .
- (c)  $9.80665$ .
- (d)  $98066.5 \times 10^{-4}$ .
- (e)  $98.0665 \times 10^{-1}$ .

6. The set  $\{2, 0.\overline{35}, \sqrt{5}, -3, -\frac{1}{2}, 0.341352\dots, -\sqrt{-9}\}$  contains:

- (a) two natural numbers.
- (b) three integer numbers.
- (c) five rational numbers.
- (d) six real numbers.
- (e) three irrational numbers.

7. Which one of the following is a Polynomial?

- (a)  $x^2 + 3x^{-1} - 5$ .
- (b)  $0$ .
- (c)  $\frac{3x-1}{2x}$ .
- (d)  $(\frac{2}{x})^2$ .
- (e)  $5x^3 - 2x + x^{\frac{1}{2}} - 2$ .

8. Which one of the following statements is TRUE?

- (a)  $\frac{5}{x-5} = \frac{x}{x-5}$  is a conditional equation.
- (b)  $|x| = 0$  is a contradiction.
- (c)  $(x+3)^2 = x^2 + 9$  is an identity.
- (d)  $x(x+5) = x^2 + 5(x+1)$  is a contradiction.
- (e)  $x-3 = 0$  and  $x^2 = 9$  are equivalent equations.

PART II WRITTEN QUESTIONS:

1. Simplify  $(\frac{(-2y)^0 x^{-\frac{3}{4}} y^2}{\sqrt[3]{x} \sqrt[3]{y^{12}}})^{-4}$  where  $x > 0$  and  $y > 0$ . (Write the result without any radicals in the denominator)
2. Find the LCD (Least Common Denominator) of the following expression. (Do not simplify)  
 $\frac{x+y}{x^2+2xy-3y^2} - \frac{2y}{x^2+xy-6y^2} + \frac{5}{3(x-y)}$ .
3. Rewrite the expression  $-3x\sqrt[3]{54x^4} + 2\sqrt[3]{16x^7}$  in the simplest form.
4. Find the solution set of the equation:  
 $\frac{4}{2m-1} - \frac{1}{m+1} = \frac{-5}{1-2m}$ .
5. Solve for  $r$  in the equation  $s = \frac{a+r}{1-r}$ .
6. If  $z = i^{2002} + i^{-1423} + \sqrt{-8}\sqrt{-2}$ , then find  $\bar{z}$  ( the conjugate of  $z$ ). ( Note that  $i = \sqrt{-1}$ )
7. Write the complex number  $\frac{4+i}{3+i} - \frac{1}{3-i}$  in standard form. ( Note that  $i = \sqrt{-1}$ )
8. If

$$\begin{aligned} A &= \{x|x \text{ is a composite number less than } 18\}. \\ B &= \{x|x \text{ is an even number and } 0 \leq x < 20\}. \\ C &= \{x|x \text{ is a prime number not greater than } 13\}. \end{aligned}$$

(a) List all elements of  $A$ ,  $B$ , and  $C$ .

$$\begin{aligned} A &= \\ B &= \\ C &= \end{aligned}$$

(b)  $(A \cap B) \cup C =$

9. Write without absolute value notation  $|\frac{1-x}{|x-\frac{1}{2}|+|x+\frac{1}{2}}|$ , given  $0 < x < 0.2$ .
10. Factor as completely as possible:
  - (a)  $4x^2 + 2x - y - y^2$ .
  - (b)  $64 - x^6$ .
11. Simplify the following expressions:

- (a)  $\frac{y^2+6y+9}{y^3+27} \div \frac{y+3}{y^3-3y^2+9y}$ .
- (b)  $(x - 1 - \frac{6}{x}) \div (1 + \frac{2}{x} - \frac{15}{x^2})$ .
- (c)  $(\frac{a^{-1}b-ab^{-1}}{a^2-b^2})^{-1}$ .

12. If the coefficient of  $x^3$  in the product  $(2x - 3)^3(3x - k)$  is 20, then find the value of  $k$ .
13. Find all positive values of  $k$  such that  $36x^2 + kx + 100$  is a perfect square trinomial.
14. Rationalize the denominator of  $\frac{6\sqrt{6}}{5+\sqrt{6}}$  and write the result in the simplest form.
15. Find the value of  $\frac{-3^2+6\div\sqrt[4]{(-3)^4+2}}{2-\sqrt[7]{(-3)^7}}$ .