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**University Examinations 2014/2015**

FIRST YEAR, SPECIAL/SUPPLEMENTARY EXAMINATION FOR DIPLOMA IN BUSINESS ADMINISTRATION

**SMB 2200: BASIC MANAGEMENT MATHEMATICS**

**DATE: OCTOBER, 2015 TIME:** $1½$**HOURS**

**INSTRUCTIONS:** *Answer questions* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE - (30 MARKS)**

1. Given the following sets;

A = $\left\{5, 6, 7, 9\right\}$

B = $\left\{6, 8, 13, 14\right\}$

C = $\left\{6, 7\right\}$

Find:

1. A$∪B$ (1 Mark)
2. A$∩B$ (1Mark)
3. A$∪B∪C$ (2 Marks)
4. A$∩B∩C$ (2 Marks)
5. Solve the simultaneous equation (3 Marks)

7x -3y = 41

3x – y = 17

1. Solve the quadratic equation using the completing square method. (3 Marks) 2x2 – 11x + 12 = 10
2. Solve for x in the equation. (2 Marks)

 82x = 5

1. Solve the inequalities (3 Marks)

 -7x + 2$ \leq 4x-8$

1. The 3rd term of a A.P is 34 and the 17th term is -8. Find the sum of the first 20 terms. (3 Marks)
2. Evaluate the limit

 (3 Marks)

1. Set R is defined as R= $\left\{a, b, c, \right\}$
2. How many subsets can be constructed from this set? (2 Marks)
3. Write down all the subsets belonging to R (3 Marks)
4. Evaluate the limit;

 (3 Marks)

**QUESTION TWO (15 MARKS)**

1. Solve $the $simultaneous equations

 $\frac{3x-2y}{2}= \frac{2x+y}{7}+ \frac{3}{2}$ (4 Marks)

7 - $\frac{2x-y}{6}$ = x +$\frac{y}{x}$

1. A researcher interview 150 students in science; 70 were physics students; 50 were registered in chemistry; 90 were biology students; 30 were registered in physics and chemistry;20 registered in chemistry and Biology;30 registered in physics and biology and 10 registered in chemistry, biology and physics. Using Venn diagrams find the following;
2. The number of students registered in two courses only (3 Marks)
3. The number of students registered in only one course. (2 Marks)
4. The number of students registered in none of the three courses (2 Marks)
5. The number of students registered in atleast two courses. (2 Marks)
6. The universal set T and its subsets A,B and C are defined as;

T = $\left\{1, 3, 5,7,9,11\right\}$

A = $\left\{3,7\right\}$

B = $\left\{3,9,11\right\}$

C= $\left\{3,5\right\}$

Determine:

1. A $∩ B'$ (1 Mark)
2. $A U B ^{'}$ (1 Marks)
3. (A$∩B∩C'$) (1Marks)

**QUESTION THREE ( 15 MARKS)**

1. The 5th term of an A.P is17 and the 11th term is 38. Determine the sum of the first 20 terms of the series. (4 Marks)
2. Find the limiting value of;$ \frac{3n^{2}-5n+4}{ 4n^{2}+7n+1}$ as n$\rightarrow \infty $ (3 Marks)
3. Use the method of completing the square to solve the quadratic equation

$2x^{2}$- 13x+15 = 0 (4 Marks)

1. £250 per month is invested in a fund for a year and attracts interest at 10.5% compounded monthly. How much is the fund worth at the end of the year? (4 Marks)

**QUESTION FOUR (15 MARKS)**

1. Analyze the continuity of $f(x)$ at $x =1/8$
2. $f\left(x\right)= 3+8x$ (4 Marks)
3. $f\left(x\right)= 3x+8$
4. Solve the simultaneous equation by substitution method. (3 Marks)

2x + y = 8

3x – 2y = $-2$

1. The quantity of coffee demanded is related to the price of coffee as shown by the following function.

 $Q=3-^{1}/\_{3}P$

where Q is the quantity of coffee demanded and P is the price of coffee.

1. Draw the graph of the function. (3 Marks)
2. What is the demand for coffee when the price of coffee is zero. (2 Marks)
3. What is the demand for coffee at the following price levels 2,4,and 6? (3 Marks)

**QUESTION FIVE (15 MARKS)**

1. Solve for x

$e^{2x}=5$ (2 Marks)

1. Evaluate ;



1. Solve $ax^{2}+bx+c=0 $by completing the square method. (4 Marks)
2. A customer makes a single deposit of Ksh 16000 in an account that pays compound interest at a rate of 6% per annum.
3. How much is the investment worth after 12 years? (3 Marks)
4. After how many years will the investment be worth three times its initial value? (4 Marks)