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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2012/2013 ACADEMIC YEAR**  
**FIRST YEAR, SECOND SEMESTER EXAMINATION**  
**FOR THE DEGREE OF BACHELOR OF SCIENCE**  
**(BUSINESS ADMINISTRATION)**

Date: 27<sup>th</sup> April, 2013  
Time: 11.00am – 1.00pm

**KBA 106 - BUSINESS MATHEMATICS**

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

- a) Define the following terms;
- i) A disjoint set (2 Marks)
  - ii) Union of sets and give an example (4 Marks)
  - iii) A function (2 Marks)
- b) Let the universal set  $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ . If  $A = \{3, 4, 5, 7\}$ ,  $B = \{8, 7, 3, 10, 1\}$  and  $C = \{7, 3, 9, 10\}$  are subsets of  $U$ , show that  $A - B = A \cap \bar{B}$  (4 Marks)
- c) Given that  $h(x) = x^2 - x$ . Find the values of
- i)  $h(5)$
  - ii)  $h(-3)$
  - iii) Let  $g(x) = x + 5$  and  $f(x) = x^2$ , find  $g(f(x))$  (8 Marks)
- d) Let  $A = \{1, 2, 4\}$ ,  $B = \{3, 4, 6\}$  and  $U = \{1, 2, 3, 4, 5, 6\}$ .  
Find
- i)  $A - B$
  - ii)  $B - A$
  - iii)  $A \cap B^c$
  - iv)  $B \cap A^c$
  - v) Represent  $A, B, U$  on a venn diagram. (10 Marks)

**QUESTION TWO (20 MARKS)**

- a) Find the equation of the tangent to the curve  $y = x^2 + x + 1$  at the point  $(1,3)$  (5 Marks)
- b) Integrate  $\int(x^2 + 3x^2 + 5)dx$  (3 Marks)
- c) Find the normal to the curve at  $x = 4$  where  $y = 3x^2 + 2$ . (8 Marks)
- d) Differentiate the following function with respect to  $x$   
 $y = 2x^2 + 5x + b$  (4 Marks)

**QUESTION THREE (20 MARKS)**

- a) Find the Interest on a deposit of ten thousand shillings for 3 years at a rate of interest of 10% p.a. compound interest. (9 Marks)
- b) If the deposit of 2000 shillings earns a simple interest of 200 shillings after a period of 5 years, find the rate of interest p.a. (4 Marks)
- c) Solve the following linear inequality  $2x - x + 5 < 3x + 2 \leq 5x + 3$  (7 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Simplify  $\frac{4xy - 3x + 8y^2 - 6y}{8y - 6}$  (5 Marks)
- b) What is the present value of a series of payments of \$100 received every quarterly for 10yrs if money is worth 12% p.a. compounded quarterly. (6 Marks)
- c) Find the accumulated value of \$500 per year for 4 yr. If interest is 10% compounded annually. (4 Marks)
- d) Solve the following simultaneous equations  
 $5x - 2y = 3$   
 $y - 3x = -2$  (5 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Find,  $x \xrightarrow{\lim} 1 \frac{x^2 - 1}{x - 1}$  (5 Marks)
- b) Make  $R$  the subset of the formulae  $T = \frac{2n}{2m} \sqrt{\frac{3k}{L - R}}$  (5 Marks)
- c) Find the equation of a straight line that is perpendicular to the line whose equation  $3y - 3x = 5$  at the point where  $x = 0$  (5 Marks)
- d) Use quadratic formula to solve the equation  $5x^2 + 2x - 3 = 0$  (5 Marks)