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**University Examinations 2014/2015**

SECOND YEAR, FIRST SEMESTER EXAMINATION FOR DIPLOMA IN BUSINESS ADMINISTRATION

**SMA 2200: BASIC MANAGEMENT MATHEMATICS**

**DATE: APRIL 2015 TIME:** $1\frac{1}{2}$ **HOURS**

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

**QUESTION ONE (30 MARKS)**

1. You are provided with the set

A=

B=

Universal set = 

Determine

1. A
2. (A)
3. Solve for x in the quadratic equation 
4. Evaluate  (4 marks)
5. A bank loans at 15% nominal interest compounded monthly. Determine the annual percentage rate (APR) (3 marks)
6. How much will have to be invested now to produce Ksh 50,000 after 5 years at 10% compound interest rate (4 marks)
7. Solve the inequality  (3 marks)
8. John and Mary formed a partnership. John contributed $\frac{1}{12}$of his salary towards the cost of the company while Mary contributes $\frac{1}{10}$ of her salary in the first month bringing the total to Ksh. 9800. In the following month they contribute $\frac{1}{8}$ and $\frac{1}{6}$ respectively of their salaries to make the total contribution for the second month to be Ksh. 15500. what were their respective salaries (4 marks)
9. Determine the current value of Ksh. 100,000 in 5 years time discounted at 10% (2 marks)

**QUESTION TWO (15 MARKS)**

1. A business rents its premises for Ksh. 120,000 for the first year on the agreement that the rent will increase by Ksh. 10,000 every year. What will be the rent in the 10th year (3 marks)
2. An employee receives fixed annual increment on his salary. If his final salary is Kah. 90,000 and the total salary over 10 years period is Ksh. 650,000, determine his initial salary (4 marks)
3. A building costs Ksh. 1,000,000 and is depreciated at 10% p.a on the reducing balance method. What will be its written down value after 20 years (4 marks)
4. What compound interest rate will be required to produce Ksh. 500,000 after 5 years with an initial investment of Ksh. 40,000 (4 marks)

**QUESTION THREE (15 MARKS)**

1. A business person wishes to purchase not less than 100 items comprising books and pens. A book costs Ksh. 20 and a pen Ksh. 10. If he has Ksh. 2200 to spend, form all possible inequalities from the given conditions and graph them to indicate the region that satisfies the inequalities (5 marks)
2. Simplify and solve for $x$

 (5 marks)

1. Find the equation of a line that passes through the point $(2,-5$) and perpendicular to the line $y=3-3x$ (5 marks)

**QUESTION FOUR (15 MARKS)**

1. An investment is considered for which the net cash flows have estimated as follows:

year 0 year 1 year 2 year 3 year 4

 -100,000 30,000 47,000 48,000 32,000

(i) Determine the NPV given that the discount rate is 20% (4 marks)

(ii) State with reason whether the project is acceptable (2 marks)

1. Determine the present value for receiving Ksh. 50,000 in a years time , Ksh 100,000 in 2 years time and Ksh. 150,000 in 3 years time at a discount rate of 10% (3 marks)
2. Determine the present value of a perpetual annuity of Ksh. 30,000 at 20% (3 marks)
3. What is the current value of an annuity of Ksh. 50,000 p.a received for 10 years when the discount rate is 10% (3 marks)

**QUESTION FIVE (15 MARKS)**

1. Solve for x in the equation

 (4 marks)

1. A college has 320 students. 85 students are in a band, 200 students are in sports teams while 6o students are in both activities. Using Venn diagrams to determine:
2. How many students are in either the band or sports (3 marks)
3. How many students are neither in band or sports (3 marks)
4. Determine if the following functions is continuous at $x=1$ (5 marks)

