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MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS**

**2016/2017 ACADEMIC YEAR**

**FIRST YEAR FIRST SEMESTER**

**SCHOOL OF BUSINESS AND ECONOMICS**

**CERTIFICATE IN BUSINESS MANAGEMENT**

**COURSE CODE: CBM 02**

**COURSE TITLE: BUSINESS MATHEMATICS**

**DATE: 28TH APRIL 2017 TIME: 8.30AM-10.30AM**

**INSTRUCTIONS TO CANDIDATES**

* ***Answer question ONE (compulsory) and any other THREE***
* ***Question one carries 25 marks***
* ***All other questions carry 15 marks***

 *This paper consists of 5 printed pages. Please turn over*

**QUESTION ONE**

(a)Solve for x in the following;-

 (i) {3-(5x-4)} +5x= 0 **(3marks)**

 (ii) 2x+6 - x-2 = 1 **(3marks)**

 6 2 12

 (iii) 2(1+x) +3(x-2)>25 **(3marks)**

(b)Calculate the rate per annum, at which a certain a mount of money doubles after being invested for a period of 5years compounded annually **(3marks)**

(c) A Car is valued at ksh 800,000 and is expected to depreciate by a value of 20% each year. Find its value after 3years **(4marks)**

(d) Distinguish between interest and Rate in financial mathematics

 **(2marks)**

e) Simplify the following fractions;- **(4marks)**

1. 2 + 4

2+x 1-3x

1. 1 + 1

x-bx+b

f) Given the roots of a certain equation to be x=-6 and x=4 obtain the equation in the form ax2+bx+c=0 **(3marks)**

**QUESTION TWO**

(a)Solve by Elimination method **(4marks)**

 3x+2y=3

 5x+3y=15

(b)Solve by Matrix method  **(4marks)**

 y-2x=2

 3y+x=20

(c)Consider three consecutive positive integers. If the third is subtracted from the sum of the first two numbers, the difference is 10.Find the numbers

 **(4marks)**

(d)Solve by substitution method **(3marks)**

 x+y =220

 x/y =5/6

**QUESTION THREE**

(a)A ladder is leaning on the wall making an angle of 45 degrees with the horizontal. If the length of the ladder is 4m, how high does it lean on the wall

 **(4 marks)**

(b)Solve the following using the method indicated against each equation.

 (i) x2-6x+9=0 (Factorization) **(2marks)**

(ii) 3x2=11x+4 (Completing square method) **(3marks)**

(iii) 3y2+6y+2=0 (Quadratic formula) **(3marks)**

(c)Given that the roots of a certain quadratic are x=-3 and x=2.Obtain the equation in the form;-

 ax2+bx +c **(3marks)**

**QUESTION FOUR**

1. Find the determinant of the following matrices.

 1 -3 **(2marks)**

 2 -4

1. Find the values of x and y if: **(4marks)**

x + 2y 14 = 4 14

 -3 y-2 -3 7+3x

1. Solve the following simultaneous equations using matrix method.

3x + y = 4

4x + 3y = 7 **(4marks)**

 (d)The length of a room is 3m greater than its breath. If the area is 270m2.Find the dimension of the room **(3marks)**

(e)Obtain the product of the following;-

 3x(x2+4x+a)  **(2marks)**

**QUESTION FIVE**

 (a)A swimming pool of water surface measures 10m long by 8m wide. A path of uniform width is made all round the swimming pool. The total area of the water surface and the path is 168m2. Find the with of the path **(4marks)**

(b)All employees of Silver Spring enterprise enterprise pay income tax at the rate shown in the table below.

|  |  |
| --- | --- |
| Taxable Income | Rate in Sh.per Kenya pound |
| 1-3780 |  2 |
| 3781-7560 |  3 |
| 7560-11340 |  4 |
| 11340-over |  5 |

Mr. Ali earns a basic salary of Sh.12, 150 and a house allowance of Shs.2, 800 per Month. He is entitled to a family relief of Sh. 450 per month. A part from income tax the following deductions are also made from his monthly pay.

 (i)Servicing loan payment sh.450

 (ii)Hospital fund sh.260

 (iii) Sacco contribution sh. 120

Determine Mr.Ali’s net income **(6marks)**

c)Let D=(3,5,7,9), E=0,4,6,9) and F=(0,3,6,7), U=(0,1,2,7,4,5,6,7,8,9)

Draw a Venn diagram for **(5marks)**

D$∩$E$∩$F