TECHNICAL UNIVERSITY OF MOMBASA
SCHOOL OF BUSINESS

DEPARTMENT OF MANAGEMENT SCIENCE

UNIVERSITY EXAMINATIONS 2016/2017

FIRST YEAR FIRST SEMESTER EXAMINATIONS FOR BACHELOR OF

SCIENCE IN MARITIME MANAGEMENT

BMS 4103: MANAGEMENT MATHEMATICS

END OF SEMESTER EXAMINATIONS
SERIES: DECEMBER 2016
TIME: 2 HOURS

INSTRUCTIONS:

1. Answer Question **ONE (Compulsory)** and any other **TWO** questions.
2. Question one carries 30 marks
3. Other questions carry 20 marks each.
4. Marks will be awarded to students who demonstrate accuracy and clarity of presentation.
5. Calculators are allowed in the examination room.

QUESTION 1 (COMPULSORY)

a) State the meaning of the following terms.   (10 marks)

    i.   Rate

    ii.   Cipher

    iii.   Bankruptcy

    iv.   Foreign exchange

    v.   Piece rate

b) A bankrupt's assets realize for Sh.150, 000 and he pays 35 cents in the Sh. To his creditors. How much did he owe?   (5 marks)

c) From the following information, prepare a payroll for the month of July 2016 (15 marks)

Employee No.	Name	No. of Hours worked	Hourly rate (Sh.)	Advance paid (Sh.)
0001	Mary	200	12	900
0002	Paul	170	14	600
0003	Peter	210	20	1000
0004	James	180	15	800
0005	Alex	190	18	1200
0006	Joseph	210	16	1500

Additional information;

    i.   Normal working hours per month are 180. For extra hours 50% above normal hourly rate is payable

    ii.   P.A.Y.E to be deducted at the rate of 10% of gross wage

    iii.   N.S.S.F to be deducted Sh. 80 for each employee

    iv.   N.H.I.F to be deducted Sh.20 for each employee

QUESTION 2

a) A quadratic equation is defined as $ax^2 + bx + c = 0$, show that $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ (8 marks)

b) An investment earns interest of 7 per cent per year compounded annually. If sh. 5,000 is invested at the end of each year, to what sum will the investment have grown by the time of the tenth deposit? (6 marks)

c) Find the compound interest on Sh.100,000 at 10% per annum for 10 years (6 marks)

QUESTION 3

a) Apply contracted method to solve to the nearest two decimal places

   378.5623×0.2567 (7 marks)

b) The slope of a linear savings function is 0.75. Compute and plot the corresponding consumption (C) function when consumption equals to 100 when income (Y) equals to 0. (7 marks)

c) Compute the cost of 800 articles at Sh. 2.65 by simple practice (6 marks)

QUESTION 4

a) A banker discounts a bill for Sh. 9,250 at the rate of 15%. The discount deducted was Sh.750. Find the days for which the bill was to run. (6 marks)

b) John bought 1,250 shares at Sh. 1,750 each (Nominal value Sh.15). The dividend was declared at 15%. Calculate dividend received and dividend as a percentage of amount invested (6 marks)

c) Distinguish between the following terms

   i. Annuity and present value of annuity (4 marks)

   ii. Sinking fund and loan amortization (4 marks)

QUESTION 5

a) A two commodity market model is defined as below. Determine the equilibrium prices and quantities for the two commodities given $Q > 0$. (8 marks)

$$Q_{d_1} = 4 - P_1 + \frac{1}{2}P_2$$
$$Q_{d_2} = 10 + P_1 - P_2$$
$$Q_{S_1} = -3 + 4P_1$$
$$Q_{S_2} = -1810 + 4P_2$$

b) Solve $|Z - 4| = 10$ (6 marks)

c) If a man working 8 hours a day take 15 days to complete a job, how long would it take 20 men working 6 hours a day to complete the same job? (6 marks)