QUESTION ONE (Compulsory) (25 marks)

a) Explain the importance of management mathematics in business management (10 marks)

b) Explain three features of sound investment methods (6 marks)

c) Using a Venn diagram, together with mathematical illustrations explain the following terms as used in set theory

i. Mutually exclusive sets (3 marks)
ii. Intersection of sets (3 marks)
iii. Union of sets (3 marks)

QUESTION TWO (15 marks)

a) A company manufactures televisions sets that sell to retailers for $950. The cost of making x of these TVs for a month is given by the cost function $C(X) = 470x + 120{,}000$

i. Find the revenue function R for selling X televisions
ii. The revenue for selling 1100 television sets
iii. Profit function and profit for selling 600 television sets (7marks)

b) Assume the company wants to invest in two mutually exclusive projects of Ksh 100,000 each generating the following cash flows

Year	Project A	Project B
1	50000	50000
2	40000	90000
3	30000	120000
4	40000	130000
5	-	130000
6	-	130000

Required;

Using payback period advice the company on which project to invest in (8 marks)

QUESTION THREE (15 marks)

a) A company has decided to invest Ksh. 300,000 each year at 9% compound interest. What will the fund be worth after 6 years? (7 marks)

b) Discuss disadvantages of using accounting rate of return as a method of appraising investment projects. (8 marks)

QUESTION FOUR (15 marks)

a) Distinguish between simple interest and compound interest as used in financial mathematics (5 marks)

b) ksh 40,000 is earned after investing a certain amount of money for 6 years at a rate of interest of 12% p.a compounded half yearly. Determine the amount that had been invested (6marks)

c) Explain the concept of time value of money (4 marks)

QUESTION FIVE (15 marks)

a) A company has considered an investment for which the net cash flows in Ksh has been estimated as follows

Year (0)	Year 1	Year 2	Year 3	Year 4
15,000	4500	4900	5400	2900

Using net present value, advice the company if the investment is viable If the discounting rate is 12%. (8 marks)

b) The universal set Ù is defined as the set of positive integers. The subset A and B are defined as follows $A = (Intergers\ that\ are\ multiple\ of\ 4\ less\ than\ 50)$And $B = (Integers\ that\ are\ multiple\ of\ 6\ less\ than\ 50)$. Using a Venn

diagram place the elements of A and B in the appropriate region

(7 marks)

QUESTION SIX (15 marks)

a) Consider the following demand and total cost functions

$$Q = 10 - \frac{1}{2}P$$

$$TC = 2 + 20Q - 8Q^2 + Q^3$$

Required

i. Develop the profit function (5 marks)
ii. At what level of output is profit maximized (5 marks)

b) The universal set Ụ is defined as the set of positive integers less than 10. The subsets A and B are defined as follows A = {Integers that are multiple of 3} and B = {Integers that are factors of 30}

Required

Draw a Venn diagram to represent the above information

(5 marks)

136235