



MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS 2018/2019 ACADEMIC YEAR SECOND YEAR SECOND SEMESTER

SCHOOL OF SCIENCE BACHELOR OF SCIENCE

COURSE CODE: STA 2218

**COURSE TITLE: PRINCIPLES OF ACTUARIAL
SCIENCE**

DATE: 26-4-2019

8:30-10:30AM

TIME: 2 HOURS

INSTRUCTIONS TO CANDIDATES

Answer Question **ONE** and any other two questions

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

1a(i) Explain the difference between Annuities and Premiums (3Mks)

(ii) Discuss the seven principles of insurance (7mks)

(iii) What is actuarial science (2Mks?)

(iv) Discuss three origins of actuarial science (3mks)

(v) What is life table (2mks?)

(vi) a) Study the life table below and fill the missing parts (8 mks)

X	L_x	dx	q_x	P_x
65	1000	7		
66	993		0.00806	
67	985			0.99086
68	976	10		
69	966			

(b) Using the completed life table, calculate the probability that a life aged 65 surviving for four years (5mks)

2(i) What is discounted cash flows? (2mks)

(ii) Write an expression for calculating discounted cash flows defining all the components involved. (3Mks)

(iii) **State** three purposes for discounted cash flows (3mks)

(iv) Andrew is retired. He has pension but has capital of ksh 500,000. He is considering the following options: A; Purchasing annuity from insurance company that will pay an equal amount for the rest of his money.

B; purchase an annuity from an insurance company that will pay an amount that increases with the cost of living for the rest of his life.

C; purchase a 20-year annuity certain.

What are the advantages and disadvantages of each option? (6mks)

(vi) Ali could have two options of investing ksh 500,000; he could set the ksh500,000 in a new home that he expects to be able to sell in 10 years for ksh750,000 or

he could invest the money in a real estate investment that is expected to return 10% per year for the next 10 years. Using the discounted cash flow analysis advice Ali the best option for investment (6mks)

3. (i) Define capital investment appraisal?(1mk)

(ii) Discuss the basic assumptions for capital investment appraisal (6mks)

(iii)Discuss the main steps in making decision about capital investments (6mks)

(iv) A firm intends to acquire a new machine costing ksh 50,000 which is expected to have a life five years with a scrap value of ksh 10,000 at the end of that time. Cash flows arising operation of the machine are expected to arise on the last day of each year as follows;

End of year	ksh
1	10,000
2	15,000
3	20,000
4	25,000
5	25,000

(a)Calculate; i) The payback period (1mk)

(ii)The accounting rate of return (2mks)

II) The net present value (2MKS)

(b)Explain the meaning of each value obtained in (I), (ii) and (iii) assuming a discount of 10% per year. (2mks)

4. (i) Define survival analysis(2mks)

(ii)Discuss the concepts of withdrawals as is in survival data analysis (2mks)

(iii)Study the life table below and use to answer the questions that follows

x	l_x	d_x	w_x
65	1000	7	5
66	988	8	4
67	976	9	6
68	961	10	4
69	947		

(a)Calculate the mortality survival rate (3mks)

(b)Calculate the mortality rate (2mks)

(iv). A company wish to invest ksh.50, 000,000 in equipment for a project that generate ksh 15 000 000 per year for four years. At the end of the project the equipment can be sold at ksh 12,000,000.The Company WACC is 12% .Is it worthwhile for the company to purchase the equipment? Show your workings.(6mks)

//END