TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF ENVIROMENT & HEALTH SCIENCES

UNIVERSITY EXAMINATION FOR:

MASTER OF PUBLIC HEALTH

MPH/17S/YEAR 1/ SEMESTER 1

APH 5108: PRINCIPLES OF EPIDEMIOLOGY

SPECIAL/ SUPPLIMENTARY EXAMINATIONS
SERIES: SEPTEMBER 2018
TIME: 3 HOURS

Instructions to Candidates
This paper consists of SIX questions
Answer question ONE (COMPULSORY) and any other THREE questions.
This paper consists of three printed pages.
Mobile phones are NOT allowed in the examination room

QUESTION ONE (30 MARKS)

a) Select a health problem or disease with which you are familiar. Describe the occurrence in terms of person, place and time (9 marks)

b) A cross-sectional study of Down's syndrome has found an association with birth order. What could be a cause of confounding and how would you avoid? (4 marks)

c) Randomization performs three functions in a randomized clinical trial. Describe the three functions (9 marks)

d) A new test was compared with a gold standard measurement with the following results:

	Gold standard	
	Positive	Negative
Positive	18	2
Negative	8	72

Calculate the following from the information given above

i) Sensitivity (2 marks)

ii) Specificity (2 marks)

iii) Positive predictive value (2 marks)

iv) Negative predictive value (2 marks)

QUESTION TWO (30 MARKS)

Outline the design of a case-control study and a cohort study to examine the association of high-fat diet with bowel cancer (30 marks)

QUESTION THREE (30 MARKS)

Discuss the major steps in an investigation of a food-borne outbreak (30 marks)

QUESTION FOUR (30 MARKS)

a. In a particular community, 115 persons in a population of 4399 became ill with a disease of unknown etiology. The 115 cases occurred in 77 households. The total number of persons living in these 77 households is 424 (10 marks)
   i) Calculate the overall attack rate in the community (2marks)
   ii) Calculate the secondary attack rate in the affected households, assuming that only one case per household was a primary (community-acquired) case (2marks)
   iii) Is the disease distributed evenly throughout the community? (3marks)
   iv) Describe three situations where attack rate is used instead of incidence (3marks)

b. Contrast the epidemic curves as encountered in: (10marks)

QUESTION FIVE (30 MARKS)

a) Discuss the main types of systematic error in epidemiological studies (15 marks)

b) Explain techniques used in medical research to reduce information bias (15 marks)

QUESTION SIX (30 MARKS)

Use the table below for question four

Age group	Kenya 2017			Kisumu 2017			Mombasa 2017		
	Population	**Deaths from Malaria**	**Deaths from Accidents**	**Population**	**Deaths from Malaria**	**Deaths from Accidents**	**Population**	**Deaths from Malaria**	**Deaths from Accidents**
<5	18,250,000	469	3,871	60,000	0	13	812,000	24	260
5-44	150,020,000	17,082	50,377	368,000	52	242	6,543,000	1,077	2,584
45-64	42,300,000	103,488	14,807	78,000	180	50	2,528,000	7,464	794
65+	29,840,000	242,617	25,838	19,000	210	15	2,140,000	21,599	1,482
Total	**240,410,000**	**363,656**	**94,893**	**525,000**	**442**	**320**	**12,023,000**	**30,164**	**5,120**

a) Calculate the death rate from all accidents in the age group 65 years and older for Kenya, Mombasa county and Kisumu county (6 marks)

b) Calculate the death rates from all malaria in the age group 5-44 years old for Kenya, Mombasa county and Kisumu county (6 marks)

c) Calculate the unadjusted death rates for both counties

i) Deaths from malaria (6 marks)

ii) Deaths from accidents (6 marks)

d) Use the direct method of age adjustment to calculate mortality rates in Kisumu and Mombasa for malaria. The table below provides age-specific death rates from neoplasm (6 marks)

Age-specific death rate from Malaria per 100,000				Expected number of deaths	
Age Groups	Kisumu County	Mombasa County	Kenya	Kisumu County	Mombasa County
<5	0	3.0	18,250,000		
5-44	14.1	16.5	150,020,000		
45-64	230.8	295.3	42,300,000		
65+	1105.3	1009.3	29,840,000		
Total			240,410,000		