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**W1-2-60-1-6**

**JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY**

**UNIVERSITY EXAMINATIONS 2019/2020**

**EXAMINATION FOR THE DEGREE OF BACHELOR**

**IPH 2305: EPIDEMIOLOGY I**

**DATE: APRIL, 2020 TIME: 2 HOURS**

INSTRUCTIONS: ANSWER ALL QUESTIONS IN **SECTION A** (COMPULSORY) AND ANY OTHER ONE QUESTION IN **SECTION B**

**SECTION A: 48 MARKS**

1. Explain the relevance of epidemiology in the field of public health. (6 marks)

2. Using HIV as an example, outline the five “W’s” of descriptive epidemiology. (6 marks)

3. During the recent outbreak of the novel –corona virus in Wuhan, China, 270 of 10,000 residents in a certain neighbourhood were infected.

a. Calculate the attack rate. (2 marks)

b. In a certain school within the same neighbourhood, 20 pupils out of a population of 250 pupils developed a novel-corona virus positive respiratory tract infection, following an exposure to an initial case in a class five pupil. Calculate the secondary attack rate. (2 marks)

c. State the usefulness of the secondary attack rate in Public health.

(2 marks)

4. Clinical trials fall under experimental epidemiological study designs and they are at the heart of all medical advances. Describe the phases of clinical trials.

(6 marks)

5. Highlight the phases of an epidemic curve. (6 marks)

6. The population of a certain town in Kenya was estimated to be 1,600,000 by mid-year 2019. In the same year it was estimated that a total of 180,000 people in this town were suffering from diabetes mellitus, out of which 3,000 died while 9,000 had acquired the disease in the same year. Calculate:-

a. The case fatality rate. (2 marks)

b. The period prevalence rate. (2 marks)

c. The mortality rate. (2 marks)

7. The odds ratio of high cholesterol level in myocardial infarction (MI) case is 4.7

a. Interpret this ratio. (3 marks)

b. State how this finding will affect your advice to a patient who is at a high risk for developing MI. (3 marks)

8. a. Highlight the main phases in the natural history of a communicable

disease like TB. (4 marks)

b. Explain why public health practitioners need to clearly understand the natural history of a communicable disease. (2 marks)

(TOTAL: 48 MARKS)

**SECTION B: 22 MARKS**

9. The true prevalence of syphilis in a population of 75,000 people in an isolated community is 8%. Given a screening test with a sensitivity of 99% and a specificity of 95%, answer the following questions:-

a. Determine the total number of persons the screening test will designate as

syphilis positive and syphilis negative. (6 marks)

b. Compute the proportion of false positive and false negative subjects.

(5 marks)

c. Calculate the positive and the negative predictive values for the screening test. (5 marks)

d. Determine the level of agreement between the screening test and the gold standard test and interpret the measure. (6 marks)

(TOTAL: 22 MARKS)

10. A study was conducted to determine the association between working in an out of mobile industry and developing lung cancer. Data indicated that out of 100 cases of lung cancer, 60 of these were in persons who reported to have worked in an automobile industry. Furthermore, out of 200 persons without lung cancer, 80 had also worked in an automobile industry.

a. Describe three distinct features of this study design. (6 marks)

b. Calculate the appropriate measure of association from the data provided and interpret your findings. (10 marks)

c. Explain the limitations of this study design. (6 marks)

(TOTAL: 22 MARKS)

11. The table below shows the relationship between cigarette smoking and incidence rate of stroke in a cohort of 118,539 women aged 30-55 years and all the women were free from coronary heart disease

|  |  |  |  |
| --- | --- | --- | --- |
| Smoking Category | Number of Cases  of Stroke | Person-Year of Observation  (Over 8 Years) | Stroke Incidence Rate (Per 100,000 Person-Years) |
| Never smoked | 70 | 395,594 | 17.7 |
| Ex-smoker | 65 | 232,712 | 27.9 |
| Smoker | 139 | 280,141 | 49.6 |
| TOTAL | 274 | 908,447 | 30.2 |

a. Calculate the relative risk of stroke in women who were smokers and those who were ex-smokers. (4 marks)

b. Calculate the attributable risk of smoking for stroke. (2 marks)

c. Calculate the attributable fraction of smoking for stroke in the smokers.

(2 marks)

d. Determine the population attributable fraction for smokers. (2 marks)

e. Interpret the measures you have calculate in question (a0 above. (2 marks)

f. State the public health relevance of calculating each of the measures in question (b), (c) and (d) above. (6 marks)

g. State two advantages and two disadvantages of a cohort study. (4 marks)

(TOTAL: 22 MARKS)