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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER I  
SESSION 2019/2020**

COURSE NAME : EPIDEMIOLOGY  
COURSE CODE : BWB 43003  
PROGRAMME CODE : BWB  
EXAMINATION DATE : DECEMBER 2019/JANUARY 2020  
DURATION : 3 HOURS  
INSTRUCTION : ANSWER ALL QUESTIONS

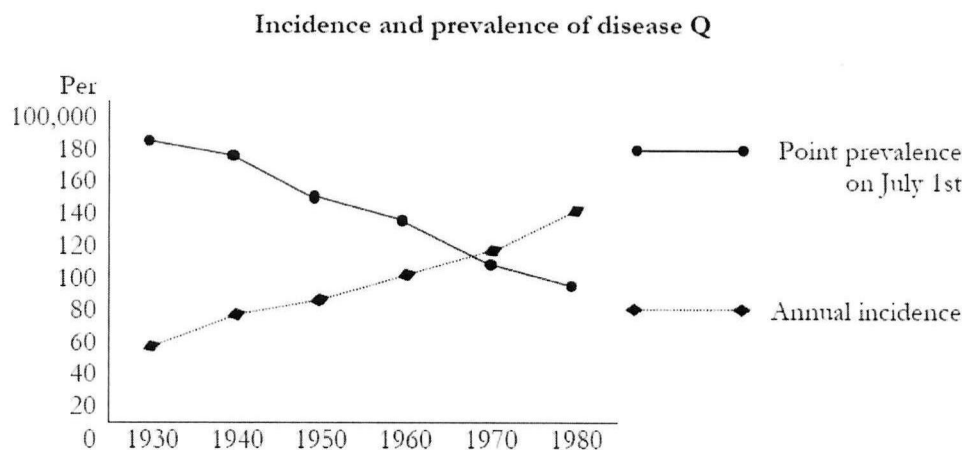
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THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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- Q1 (a) Explain the relationship between incidence and prevalence. (6 marks)
- (b) Examining the relationship between an explanatory factor and an outcome, we are interested in identifying factors that may modify the factor's effect on the outcome (effect modifiers). We must also be aware of potential bias or confounding in a study because these can cause a reported association to be misleading.
- (i) Bias, confounding and effect modification are related to the measurement and study design. State the differences between bias, confounding and effect modification. (5 marks)
- (ii) Explain what will be happen if the method used to select subjects or collect data results in an incorrect association. (5 marks)
- (c) A physician examined a population of 1,000 patients in an attempt to detect heart disease. The prevalence of heart disease in this population is known to be 15%. The sensitivity of the physician's exam is 60% and the specificity is 80%. Patients who test positive by the physician are sent for examination by a cardiologist. Calculate the positive predictive value of the physician's exam. (6 marks)
- (d) Figure Q1(d) shows the trends in incidence and prevalence for chronic disease Q over a 50-year period. Interpret the trends in the graph (3 marks)

FIGURE Q1(d)



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- Q2**
- (a) Suppose that a car travelled 24 miles in 2 hours, then continued and travelled miles in 3 hours, and then another 12 miles in 1 hour. Calculate the average rate of speed for the entire trip. (5 marks)
  - (b) Consider a class that has 20 male students and 80 female students. Find the ratio of men to women. (4 marks)
  - (c) In a hospital, a case of bird flu disease had been reported where in total, there were 123 of people who had been infected. Among them, 79 were said to be alive while another 44 died. Calculate the proportion for those who had died from the disease. (5 marks)
  - (d) In a survey of patients at a sexually transmitted disease clinic in San Francisco, 180 of 300 patients interviewed reported use of a condom at least once during the 2 months before the interview. Calculate the period prevalence of condom use in this population over the last 2 months. (5 marks)
  - (e) 100 adults were enrolled in a study on aging. At the baseline examination, 14 were found to have existing arthritis. In a follow-up examination one year later, six stated that they had been diagnosed with arthritis since the baseline examination. What was the point prevalence of arthritis at baseline? (6 marks)
- Q3**
- (a) Confounding is a distortion (inaccuracy) in the estimated measure of association that occurs when the primary exposure of interest is mixed up with some other factor that is associated with the outcome. Draw a diagram to explain the interaction. (5 marks)
  - (b) Identify the approach how to check for interaction when using stratified sampling to measure the association between an exposure and disease. (5 marks)
  - (c) Confounding can be assessed in several different ways. State **FIVE (5)** direct ways to check for confounding. (5 marks)

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- (d) In determining whether baldness causes coronary heart disease (CHD) in men, a hypothetical cohort study was carried out. The epidemiologist in charge of the study recruited 10,000 bald men and 10,000 men with hair into the study and followed all of them for 10 years to determine whether they developed CHD.

**Table Q3:** Results causes coronary heart disease (CHD) in men

	CHD	
	Yes	NO
Badly	775	9225
Hairy	190	9810

- (i) Calculate the risk of CHD among baldly men. (2 marks)
- (ii) Find the risk of CHD among hairy men. (2 marks)
- (iii) What is the relative risk of CHD associated with baldness? Interpret the results. (6 marks)
- Q4** (a) A farmer believes that exposing chickens to classical music will cause them to produce more eggs. Describe how the farmer may design a randomized comparative experiment to test this theory. (5 marks)
- (b) State **FIVE (5)** differences between bias and variability in sampling results. (5 marks)
- (c) Could we eliminate any variability in results of sampling? Justify your answer by using an appropriate example. (5 marks)
- (d) Elaborate randomization is essential and what does it accomplish? (5 marks)
- (e) What are randomized controlled trials (RCTs)? State **TWO (2)** examples in your answer. (5 marks)

- END OF QUESTIONS -

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