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UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024**

- COURSE NAME : MEDICAL STATISTICS
- COURSE CODE : BWB 43203
- PROGRAMME CODE : BWQ
- EXAMINATION DATE : JULY 2024
- DURATION : 2 HOURS 30 MINUTES
- INSTRUCTIONS :
1. ANSWER ALL QUESTIONS
 2. THIS FINAL EXAMINATION IS CONDUCTED VIA
 - Open book
 - Closed book
 3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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TERBUKA

- Q1** (a) Demographic analysis is the study of a population based on factors such as age, race, and gender, with demography data refer to the socio-economic information such as employment, education, income, marriage rates, birth and death rates.
- (i) Identify **TWO (2)** purposes of demography analysis. (2 marks)
 - (ii) List **THREE (3)** reasons of fundamental facts on population change. (3 marks)
 - (iii) Indicate **THREE (3)** events exist in the components of population change. (3 marks)
- (b) In a medical context, the word mortality refers to relative frequency of deaths in a specific population or location while sometimes known as mortality rate. The simplest measure of mortality is the number of deaths; however, this is less use for practical purposes since it's heavily influenced by the number of people who are at risk of dying. Therefore, demographers typically measure mortality by using rates.
- (i) List **TWO (2)** types of data that required in measuring mortality. (2 marks)
 - (ii) Identify **TWO (2)** reasons of using survey data in measuring mortality. (2 marks)
 - (iii) Basic demography equation includes the number of birth and death. Explain the relationship of both terms appropriately. (2 marks)
 - (iv) A recent report from Thailand provides population estimate for June 30, 2023 and for the year 2023, which are approximately 71,801279 and 72,100905 respectively. In 2023, there were 677,528 reported death cases. Estimate the death rate and the crude death rate for Thailand in 2023. (6 marks)
- Q2** (a) (i) Explain the survival time analysis. (2 marks)
- (ii) Explain **FOUR (4)** assumptions for Kaplan-Meier curve. (4 marks)
 - (iii) **Figure Q2.1** presents the survival time for filling in a tooth by one patient. This study start time is the moment when a patient goes to the dentist for a filling, and the end time of the event is the moment when the filling breaks. Interpret **Figure Q2.1** appropriately. (3 marks)

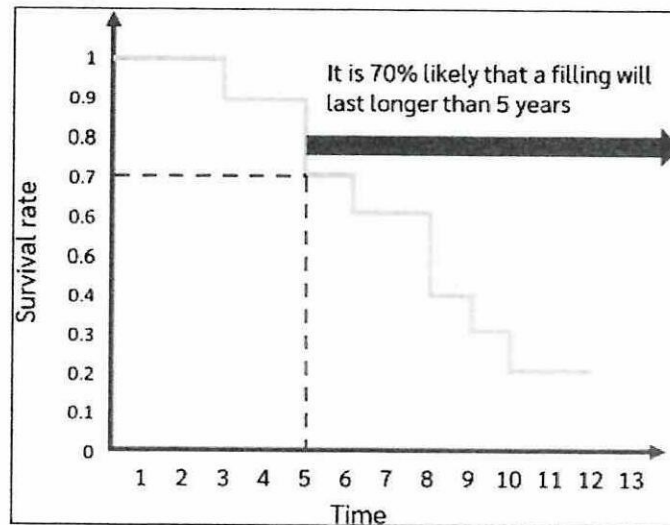


Figure Q2.1

- (b) (i) Explain the censoring appropriately. (2 marks)
- (ii) Indicate **THREE (3)** reasons of censoring in survival analysis. (3 marks)
- (iii) Explain **THREE (3)** types of censoring. (6 marks)

Q3 (a) **Table Q3.1** displays a two-by-two contingency table with a random sample of 200 adults according to the gender and level of education achieved.

Table Q3.1		
Gender	Level of Education	
	Secondary	College
Male	70	20
Female	100	10

- (i) Compute the proportions for level of education in the college for male and female respectively. (4 marks)
- (ii) Calculate the difference of proportions for level of education in the college between male and female. (1 mark)
- (iii) Compute the odds ratio between gender and level of education. (2 marks)

- (b) **Table Q3.2** represents a two-by-two contingency table for the Treatment Group used and the Myocardial Infarction that reported by Hospital Batu Pahat.

Table Q3.2

Treatment Group	Myocardial Infarction	
	Yes	No
Placebo	189	10845
Aspirin	104	10933

- (i) Compute the proportions Yes of Myocardial Infarction for both Treatment Group. (2 marks)
- (ii) Calculate the odd ratio between Treatment Group and Myocardial Infarction. (2 marks)
- (c) A two-by-two contingency table is established for students' frequency scale, ranging from four to six, across three goals: academic grades, athletic ability and popularity in sport illustrated in **Table Q3.3**. Calculate the expected counts for each cell.

Table Q3.3

Goals	Frequency Scale		
	4	5	6
Grades score	49	50	69
Athletic ability	24	36	38
Sports popularity	19	22	28

(9 marks)

- Q4** (a) (i) Define the epidemiology appropriately. (1 mark)
- (ii) Define the clinical epidemiology appropriately. (1 mark)
- (iii) Explain the different type of epidemiology studies by including appropriate illustration. (4 marks)
- (b) Identify the type of studies for the following situations.
- (i) A scientist wants to investigate how frequently people from a certain demographic such as age group, contract a particular disease. (2 marks)

- (ii) A scientist wants to determine the effects of caffeine on sleep habits. The treatment group would be people who regularly drink caffeine with the control group would match the treatment group in demographics, such as age and gender, but wouldn't regularly consume caffeine. (2 marks)
- (iii) A scientist wants to investigate about people all born during the same week from a particular region. They aim to observe multiple years' worth of differences in the behaviours, such as diet, social interactions or habits. (2 marks)
- (iv) A scientist wants to explore the prevalence of migraine in a population by taking a sample from the population and calculate the number of patients with migraine headaches. (2 marks)
- (v) A scientist wants to recruit people who do not have cancer and collect information about them for a number of years. Then, they aim to see who in the group develops cancer and who doesn't. They then look to see whether the people who developed cancer had anything in common. (2 marks)
- (c) (i) Explain the retrospective studies appropriately. (2 marks)
- (ii) Explain the prospective studies appropriately. (2 marks)

- END OF QUESTIONS -