



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2021/2022**

COURSE NAME : PROBABILITY & STATISTICS I
COURSE CODE : BWB 10403
PROGRAMME CODE : BWQ
EXAMINATION DATE : JANUARY / FEBRUARY 2022
DURATION : 2 HOURS
INSTRUCTION : 1. ANSWER **ALL** QUESTIONS
2. THIS FINAL EXAMINATION IS
AN **ONLINE** ASSESSMENT AND
CONDUCTED VIA **OPEN BOOK**.

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

TI BUKA

PART A: Answer all questions. Each question carries ONE (1) mark.

- Q1 Irdina has six tops, seven skirts and four shawls from which to choose an outfit. In how many ways can she select one top, one skirt and one shawl?
- Q2 How many arrangements are possible if only three from eight people are chosen to be a sample?
- Q3 State the boundaries for 8.6 – 8.8.
- Q4 The average number of cakes for sale in Sarah's bakery is 56 with a standard deviation of 6. The average number of cakes for sale in Arissa's bakery is 44 with a standard deviation of 5. Define whom data is more variable.
- Q5 The average delivery charge for a custom-made wardrobe in Pagoh is RM32. The standard deviation is RM4. Find the minimum percentage of data values that will fall in the range of RM20 to RM44. Use Chebyshev's theorem.
- Q6 How many outcomes of the sample space for tossing four coins?
- Q7 How many events if there are two dice are rolled?
- Q8 Find the sum of the probabilities of all outcomes in a probability distribution.
- Q9 Approximately, what is percentage of normally distributed data values will fall within 1 standard deviation above or below the mean?

(9 marks)

PART B: TRUE OR FALSE

- Q1 The expected value of a random variable can be thought of as short-run average.
- Q2 When the binomial distribution is used, the outcomes must be independent.
- Q3 One of the standard normal distribution properties is, it should be uniform.
- Q4 The central limit theorem applied to means of sample selected from different populations.
- Q5 The type of graph used to represent data is determined by the type of data collected and by the researcher's purposes.
- Q6 If a student in Probability and Statistics class score on an exam corresponds to the 65th percentile, it is represented that the student obtained 65 correct answers out of 100 questions.

(6 marks)

PART C: Answer all questions.

- Q1** In Malaysia, there are three goods that most of the people will buy when they watched film in a cinema: popcorn, snacks, and diet drinks. **Table Q1** below shows the prices, P (RM) and quantities, Q produced of these goods in 2017, 2018 and 2019.

Table Q1

	2017		2018		2019	
	P (RM)	Q	P (RM)	Q	P (RM)	Q
Popcorn	8.00	500	8.50	600	9.00	650
Snacks	5.00	300	5.50	200	6.00	210
Diet Drinks	2.50	300	2.50	400	2.50	420

- (a) Calculate Lapeyres price index for 2018 with 2017 as a base year. (3 marks)
- (b) Calculate Lapeyres price index for 2019 with 2017 as a base year. (3 marks)
- (c) Based on your answers in **Q1(a)** and **Q1(b)**, interpret the result. (3 marks)

- Q2** (a) Sarah Syuhada wants to buy one of the houses advertised for sale in property website. T is the event that the house has three or more bathrooms, U is the event that it included a balcony for each bedroom, V is the event that it costs more than RM800,000, and W is the event that it is a new house. Describe (in words) each of the following events.

- (i) T'
 (ii) U'
 (iii) V'
 (iv) $T \cap U$
 (v) $T \cap V$
 (vi) $U' \cap V$
 (vii) $V \cup W$
 (viii) $V' \cup W$
 (ix) $T \cup W$

(9 marks)

- (b) Nowadays, there are lots of RTK Antigen Covid-19 kit in pharmacy. However, some results of test are false. The probability of a person is confirmed positive Covid-19 is 0.58. Nora needs to do a Covid-19 test before she can go back to UTHM. She bought RTK Antigen Covid-19 Kit Brand A which have a 98% accuracy. Calculate the probability that, she is positive.

(5 marks)

- Q3** (a) During the pandemic Covid-19, all the restaurants need to check sanitary condition routinely done by the health officer. There are four out of every ten restaurants checked and the health officer found that there were unsatisfactory sanitary conditions. Syuhada is planning to dinner 10 times at the restaurants. Answer the following questions.
- (i) Calculate probability that Syuhada will eat at two restaurants with unsanitary conditions?
(5 marks)
- (ii) Find the probability that Syuhada will dinner at five or six restaurants with unsanitary conditions?
(5 marks)
- (iii) From your answers in **Q3(a)(i)** and **Q3(a)(ii)**, conclude the situation.
(2 marks)
- (b) Taiping is famous for its rains and known as the wettest town in peninsular Malaysia. The average amount of rain per year in Taiping is 4000 mm. The standard deviation is 8 mm. Assume the variable is normally distributed. Find the probability that next year, Taiping will receive the following amount of rainfall;
- (i) at most 4005 mm of rain.
(4 marks)
- (ii) at least 4007 mm of rain.
(4 marks)
- (iii) Compare your results in **Q3(b)(i)** and **Q3(b)(ii)**.
(2 marks)

– END OF QUESTIONS –