Universiti Tun Hussein Onn Malaysia

# UNIVERSITI TUN HUSSEIN ONN MALAYSIA

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

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|---|---|---|
| COURSE NAME | : | DEMOGRAPHY ANALYSIS |
| COURSE CODE | : | BWB 43103 |
| PROGRAMME | : | BWQ |
| EXAMINATION DATE | : | DECEMBER 2019/JANUARY 2020 |
| DURATION | : | 3 HOURS |
| INSTRUCTION | : | ANSWER **ALL** QUESTIONS |



THIS EXAMINATION PAPER CONSISTS OF **FIVE (5)** PAGES

**Q1** (a) (i) Define demography and state **TWO (2)** purposes of demography analysis. (4 marks)

(ii) State **THREE (3)** reasons of fundamental facts about population change. (3 marks)

(iii) List **THREE (3)** events in the components of population change. (3 marks)

(iv) Basic demography equation includes the number of birth and death. Explain the demographic equation appropriately. (3 marks)

(b) (i) Demographers are interested in the changes of the population structure that classified by marital status. Consider four marital statuses which are 'single' (never married), 'married', 'widowed' and 'divorced'. Draw a multiple-state representation showing these states and the possible transitions between them. (5 marks)

(ii) One way of representing the components of population change is to view them as a set of transitions made by individuals between various states. Sketch the multiple-state representation of the basic demographic equation to represent transitions states. (4 marks)

(iii) Sketch the multiple-state representations to represent the women who are in the process of bearing children. (3 marks)

**Q2** (a) (i) Data that required on both the number of events occurring within the given time interval and the population exposed to the risk of experiencing on those events to compute rate. State **THREE (3)** main data sources. (3 marks)

(ii) The simplest measure of mortality is the number of deaths. However, this is not of much 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 using rates. Explain **TWO (2)** types of data that required in measuring mortality. (4 marks)

(iii) State **TWO (2)** reasons survey data should be used in measuring mortality. (2 marks)

(iv) Lexis chart is a diagram to show the difference between the period and cohort approaches and also between $m$-type and $q$-type rate. Explain the principle behind the Lexis chart based on **Figure Q2(a)(iv)**.

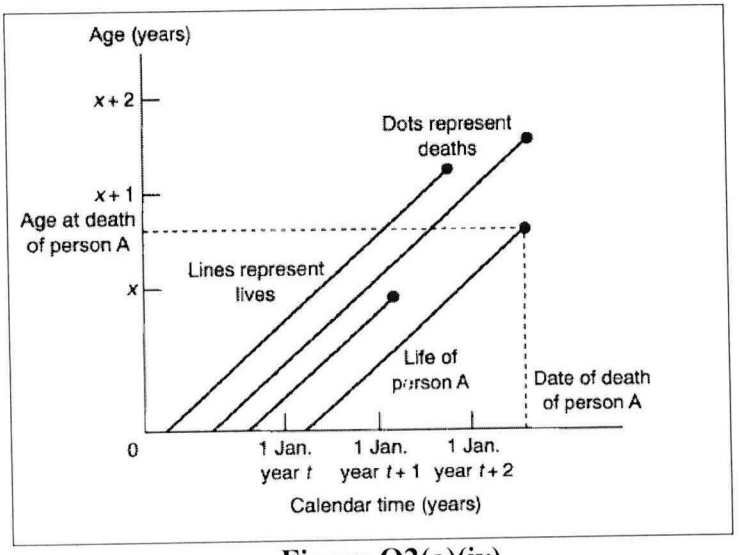


**Figure Q2(a)(iv)**

(3 marks)

(b) (i) The crude death rate not provided sufficient information about mortality since the risk of dying varies greatly with age and indicates nothing about this variation. Therefore, demographers adopt a new term to replace the used of crude death rate, which known as age-specific death rate. Define the age-specific death rate at age $x$ years.

(2 marks)

(ii) **Table Q2(b)(ii)** shows the total number of deaths in certain years with the estimated mid-year populations for those years, for certain countries in the Latin America. Compute the crude death rate for each of these countries.

**Table Q2(b)(ii)**

| Country | Year | Estimated mid-year population | Number of deaths |
|---|---|---|---|
| Mexico | 1990 | 32 322 000 | 295 796 |
| Costa Rica | 1989 | 147 404 000 | 11 64 452 |
| Colombia | 1990 | 32 987 000 | 201 166 |
| Brazil | 1991 | 3 064 000 | 12 452 |
| Argentina | 1991 | 87 836 000 | 500 615 |

(11 marks)

**Q3** (a) Identify **TWO (2)** types of mortality rates and state **TWO (2)** advantages of both mortality rates.

(6 marks)

(b) An estimated mid-year population in certain age groups with the number of deaths to people in those age groups, for males and females in North Ireland in 1987 shown in **Table Q3(b)**. Based on data in **Table Q3(b)**, calculate the age-specific death rates for the both genders.

**Table Q3(b)**

| Age group | Males | | Females | |
|---|---|---|---|---|
| | Mid-year Population (thousands) | Number of deaths | Mid-year Population (thousands) | Number of deaths |
| 1 - 4 | 1 422 | 1 637 | 1 380 | 1 325 |
| 5 - 14 | 3 062 | 1 390 | 2 968 | 920 |
| 15 - 24 | 2 430 | 2 816 | 2 318 | 1 437 |
| 25 - 44 | 4 101 | 9 690 | 4 023 | 5 942 |
| 45 - 64 | 2 755 | 36 581 | 2 753 | 18 535 |

(10 marks)

(c) **Table Q3(c)** presents the number of birth and deaths of infants aged under 1 year, classified by gender, in England and Wales in recent calendar years.

**Table Q3(c)**

| Year | Number of births | | Number of deaths of infants aged under 1 year | |
|---|---|---|---|---|
| | Males | Females | Males | Females |
| 2015 | 344 300 | 328 600 | 2970 | 2190 |
| 2016 | 343 500 | 324 100 | 2410 | 1840 |
| 2017 | 331 900 | 317 000 | 2370 | 1750 |

(i) Compute the gender-specific infant mortality rates for each of the year.

(6 marks)

(ii) Compute the combined infant mortality rates for each of year.

(3 marks)

**Q4** (a) (i) A life table is the most widely used method in the demography analysis. In the years since the first life table was constructed by John Graunt in the 17th century, life tables have been constructed for countless populations, both at national and sub-national level. Define the life table.

(2 marks)

(ii) Abridged life tables are the other type of life tables that using broader age groups to distinguish them from the life tables that based on the single years of age. Explain the notations ${}_nq_x$, ${}_np_x$, ${}_nd_x$ and ${}_nL_x$ accordingly.

(4 marks)

(b) (i) **Table Q4(b)** shows the total population (in thousands) and the number of marriages for certain Latin American countries for 1986 and 1987. Compute the crude marriage rates of each country.

**Table Q4(b)(i)**

| Country | Total population (thousands) | Number of marriages |
|---|---|---|
| Mexico, 1986 | 81 200 | 579 895 |
| Paraguay, 1987 | 2 270 | 17 741 |
| Uruguay, 1987 | 3 058 | 22 728 |

(6 marks)

(ii) Draw a multiple-state representation of the marriage process, but incorporating the additional states 'cohabiting (but not legally married)' and 'legally married, but separated'.

(6 marks)

(c) (i) Define the fertility analysis.

(1 mark)

(ii) **Table Q4(c)(ii)** shows part of fertility result in England and Wales in 1976 and 1993. Calculate the general fertility rate for 1976 and 1993 and age-specific fertility rates for age group 30-34 in 1993.

**Table Q4(c)(ii)**

| Age group | 1976 | | 1993 | |
|---|---|---|---|---|
| | Number of births (thousands) | Mid-year female population (thousands) | Number of births (thousands) | Mid-year female population (thousands) |
| 15 – 19 | 57.9 | 1809 | 45.1 | 1455 |
| 20 – 24 | 182.2 | 1672 | 152.0 | 1831 |
| 25 – 29 | 220.7 | 1855 | 236.0 | 2070 |
| 30 – 34 | 90.8 | 1593 | 171.8 | 1967 |
| 35 – 39 | 26.1 | 1374 | 58.1 | 1729 |
| 40 – 44 | 6.5 | 1300 | 10.5 | 1750 |

(6 marks)



**- END OF QUESTIONS -**