



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER I
SESSION 2015/2016**

COURSE NAME : DEMOGRAPHY ANALYSIS
COURSE CODE : BWB 43103
PROGRAMME : 4 BWQ
EXAMINATION DATE : DECEMBER 2015/ JANUARY 2016
DURATION : 3 HOURS
INSTRUCTION : ANSWER **ALL** QUESTIONS

THIS EXAMINATION PAPER CONSISTS OF **SIX (6)** PAGES

- Q1** (a) What is the definition of multiple state representations? (1 mark)
- (b) State three ways of data sources in demography analysis. (3 marks)
- (c) Give two types of mortality rate and differentiate between both types of mortality rates. (2 marks)
- (d) State one advantage and one disadvantage of the mortality rates. (2 marks)
- (e) There are mid-year population and number of deaths for 5 countries following the year, as shown in **Table Q1 (e)**.

Table Q1 (e) : Mid-year population and number of deaths for 5 countries

Country	Year	Estimated mid-year population	Number of deaths
Mexico	2009	32322000	295796
Malaysia	2010	147404000	1164452
India	2010	32987000	201166
Japan	2012	3064000	12452
Brazil	2009	87836000	500615

- (i) Calculate crude death rate following the year and comment your results. (3 marks)
- (ii) Calculate age specific death rate for Malaysia, Japan and Brazil. (3 marks)
- (f) The data in **Table Q1 (f)** refers to the female populations of England and Scotland in the mid-2000s.

Table Q1 (f) : Female populations in England 2002 and Scotland 2003

Age group	England 2002		Scotland 2003	
	Population (thousand)	Number of deaths	Population (Thousand)	Number of deaths
0-4	3062	1390	51	2343
5-14	1129	70138	134	925
15-24	4101	9690	294	614
25-44	2430	2816	243	322
45-64	1767	11832	286	132
65+	2755	36581	150	860

- (i) Using the population of England as the standard, calculate standardized death rates for Scotland. Comment on your result. (3 marks)
- (ii) Calculate standardized mortality ratios for England using Scotland as the standard population and comment on your result. (3 marks)

- Q2**
- (a) What is difference between life table and multiple-decrement life table? (2 marks)
 - (b) Abridged life tables make use the notation. Write down all the term for each notation:
 - (i) ${}_nq_x$. (1 mark)
 - (ii) ${}_n p_x$. (1 mark)
 - (iii) ${}_n d_x$. (1 mark)
 - (iv) ${}_n L_x$. (1 mark)
 - (c) Draw multiple-state representation of a double-decrement life table. (3 marks)
 - (d) The abridged life table data in **Table Q2 (d)** refer to the male populations of Singapore in 1998-2000. Using this data, calculate:

Table Q2 (d) : Male populations of Singapore in 1998-2000

Age, x	Survivors to age x , l_x	Man year lived above age x , T_x
0	100000	7700187
1	99016	7601014
10	98746	6711410
20	98497	5725004
30	98105	4741877
40	97346	3764073

- (i) The probability that a man aged exactly 10 years will survive until his 30th birthday. (2 marks)

- (ii) The infant mortality rate, q_0 . (2 marks)
- (iii) The life expectation at birth and at exact age 1 year. (2 marks)
- (iv) The probability that a man who survives until his first birthday will die between his 20th and 40th birthdays. (2 marks)
- (v) The expected age at death of those who die between their 30th and 40th birthdays. (2 marks)
- (vi) The expected age at death of those who die when they are aged under 1 year. (1 mark)

- Q3**
- (a) What is the meaning of nuptiality ? (2 marks)
 - (b) Draw five status in marriage process. (3 marks)
 - (c) State a difference between age-based and parity based. (2 marks)
 - (d) Give two approaches of period parity progression ratios and state a difference between these two approaches. (3 marks)
 - (e) **Table Q3 (e)** gives information on the number of births to women in various groups and age specific fertility rates (ASFRs) for Pakistan and India in the late 1970s.

Table Q3 (e) : The number of births to women in various groups and age specific fertility rates

Age	Pakistan, 1978		India, 1979	
	Number of births (thousand)	ASFR	Number of births (thousand)	ASFR
15-19	43.6	0.021	6.3	0.017
20-24	402.8	0.194	43.6	0.131
25-29	578.9	0.317	55.7	0.195
30-34	403.4	0.269	41.1	0.176
35-39	242.2	0.191	21.6	0.113
40-44	77.7	0.073	5.7	0.041
45-49	25.1	0.026	1.1	0.009

- (i) Calculate the general fertility rates for Pakistan and India. (3 marks)
- (ii) Calculate a standardize fertility rate for India, using the female population of Pakistan as the standard population. (3 marks)
- (iii) Calculate a standardize fertility ratio for India, using the female population of Pakistan as the standard population. (3 marks)
- (iv) Comment briefly on your results. (1 mark)

- Q4**
- (a) Differentiate the meaning of open and close birth intervals. (2 marks)
 - (b) Sketch the diagram for components of birth intervals. (4 marks)
 - (c) The mid-year population of Pakistan was 60 million in 1981. The World Bank estimated that, in mid-1991, Pakistan's population was 92 million, and that by the middle of the year 2003 it will be 150 million. Comparing the annual growth rates using the World Bank's estimation for Pakistan's population between 1981 and 1991 and between 1991 and 2003 by assuming that the growth in the population of Pakistan is either exponential or geometric growth. (8 marks)
 - (d) Assume that the World Bank's estimate of 150 million in 2003 is correct. If Pakistan's population continues to increase after 2003 at the same rate as the World Bank assumed it would increase between 1991 and 2003, when will it reach 300 million using exponential rate growth? (6 marks)

- Q5** (a) Sketch age pyramids for the growing, constant and declining population. (6 marks)
- (b) **Table Q5 (b)** represents the life table for the population of a developing country.

Table Q5 (b) : Life table for the population of a developing country

Age, x	Number of surviving to age x out of 1000 births
0	10000
1	945
10	890
20	855
30	795
40	700
50	580
60	445
70	330
80	220

- (i) Calculate the percentage of the population in each age group where the exact age in the table above denotes the boundaries between the age groups, assuming that the population is stationary. (Note: you may assume in your calculations that 1.5% of the stationary population is aged 80 years and over and the average age of people aged 80 years and over is 85 years). (5 marks)
- (ii) Calculate the percentage of the population in each age group, assuming that the population is growing exponentially at an annual rate of 2%. (7 marks)
- (iii) Comment the differences between the two age structures as in part (i) and (ii). (2 marks)

- END OF QUESTION -