

University of Colombo

Faculty of Arts

Bachelor of Arts Degree Examination (Special) – Fourth Year

Semester End Examination - Semester II- 2016/2017

DMG 4261: Population Models and their Applications

Answer three (03) questions only.

Time: Two (02) Hours

Calculators can be used and necessary tables are provided.

This paper contains five (05) questions and three (03) pages.

1. Explain the importance of population models in demographic analysis and examine how such models can be used to study mortality in a country by giving examples.

(20 Marks)

2. a) State the main characteristics of a Stationary Population Model and examine its applications.

(10 Marks)

- b) Data on the probability of employee wastage calculated based on the proportion of annual labour turn over in organizations A and B are given below. Calculate the average length of service of an employee and the annual intake required to maintain the staff at 4200 persons for those two organizations.

(10 Marks)

Service Period in Years	Proportion of annual labour turn over	
	Organization A	Organization B
0	0.399	0.650
1	0.428	0.597
2	0.340	0.480
3	0.416	0.350
4	0.520	0.250
5	0.587	0.060
6	0.335	1.000
7	0.505	—
8	0.814	—
9	1.000	—

3. a) State the characteristics of a stable population and explain how such model can be used in analysing population dynamics of a country.

(08 Marks)

- b) Following table provides life table population for males and females with intrinsic rate of growth of 0.00348. Assume that sex ratio at birth is 1.08 for each year. Construct stable population distribution for males and female separately after completing the 'multiplier' column.

(12 Marks)

Age Group	Life table population		Multiplier (1+r) ^{-y}
	Male (5L _x)	Female (5L _x)	
0-4	388986	391132	
5-9	485188	487861	
10-14	484181	486873	
15-19	482557	485444	
20-24	479357	483159	
25-29	474964	480727	
30-34	469980	478478	
35-39	464011	476066	
40-44	455942	472834	
45-49	444281	467895	
50-54	427170	459990	
55-59	402315	447234	
60-64	367117	426834	
65-69	319293	394969	
70-74	258271	347263	
75-79	187415	280730	
80-84	115889	198157	
85-89	84966	180141	
90-94	14197	26273	
95-99	1968	3402	
100+	70	173	

4. a) Compute intrinsic rate of growth using the data given in the following table.

(10 Marks)

Age group	Female ASFR per woman	Probability of Survival
15-19	0.03568	0.97317
20-24	0.06371	0.97231
25-29	0.07831	0.96728
30-34	0.05471	0.96739
35-39	0.02270	0.95967
40-44	0.00520	0.95600

b) A certain female population appears to be in a stable state has an expectation of life at birth of 58.6 years and growth rate of 2.38% per annum. Estimate the followings using the West Model Life Tables of Coale and Demeny provided.

- I. The Crude Birth Rate
- II. The Crude Death Rate
- III. Net Reproduction Rate

(10 Marks)

5. a) Explain population model that can be used to analyse fertility behaviour in Sri Lanka.

(10 Marks)

b) "Migration models are more complicater than fertility and mortality models"
examine this statement by giving examples.

(10 Marks)

STABLE POPULATIONS
 PROPORTIONS AT AGE(X), PROPORTIONS UP TO AGE(X), AND VARIOUS INDICES AT GIVEN RATES OF POPULATION GROWTH

MODEL WEST
 FEMALES

MORTALITY LEVEL 16

AGE	R=	-10.00	-5.00	0.	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
0-1		1.13	1.37	1.64	1.94	2.27	2.62	3.00	3.40	3.82	4.25	4.69	5.14	5.60
1-4		4.38	5.25	6.22	7.27	8.39	9.59	10.83	12.12	13.43	14.76	16.09	17.43	18.75
5-9		5.61	6.57	7.61	8.69	9.82	10.96	12.11	13.25	14.36	15.43	16.45	17.41	18.32
10-14		5.83	6.66	7.52	8.38	9.23	10.05	10.83	11.55	12.21	12.80	13.31	13.74	14.10
15-19		6.05	6.74	7.42	8.07	8.67	9.21	9.68	10.07	10.38	10.61	10.76	10.83	10.84
20-24		6.25	6.79	7.29	7.73	8.10	8.40	8.61	8.73	8.78	8.75	8.66	8.50	8.30
25-29		6.43	6.82	7.14	7.39	7.55	7.63	7.62	7.55	7.40	7.19	6.94	6.65	6.33
30-34		6.60	6.83	6.97	7.03	7.01	6.91	6.73	6.50	6.22	5.89	5.55	5.18	4.81
35-39		6.75	6.81	6.78	6.67	6.48	6.23	5.93	5.58	5.20	4.81	4.42	4.02	3.64
40-44		6.87	6.76	6.56	6.30	5.97	5.60	5.19	4.77	4.34	3.91	3.50	3.11	2.75
45-49		6.95	6.67	6.32	5.91	5.46	5.00	4.52	4.05	3.59	3.16	2.76	2.39	2.06
50-54		6.94	6.50	6.00	5.48	4.94	4.41	3.89	3.40	2.94	2.52	2.15	1.81	1.52
55-59		6.81	6.21	5.60	4.98	4.38	3.81	3.28	2.79	2.36	1.97	1.64	1.35	1.11
60-64		6.46	5.75	5.06	4.39	3.77	3.19	2.68	2.23	1.83	1.50	1.21	0.97	0.78
65-69		5.82	5.06	4.33	3.67	3.07	2.54	2.08	1.68	1.35	1.08	0.85	0.67	0.52
70-74		4.82	4.08	3.41	2.82	2.30	1.86	1.48	1.17	0.92	0.71	0.55	0.42	0.32
75-79		3.48	2.87	2.34	1.89	1.50	1.18	0.92	0.71	0.54	0.41	0.31	0.23	0.17
80+		2.83	2.27	1.79	1.40	1.08	0.82	0.62	0.46	0.34	0.25	0.18	0.13	0.09
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1		1.13	1.37	1.64	1.94	2.27	2.62	3.00	3.40	3.82	4.25	4.69	5.14	5.60
5		5.51	6.62	7.85	9.21	10.66	12.21	13.83	15.52	17.25	19.01	20.78	22.57	24.35
10		11.12	13.19	15.46	17.90	20.48	23.17	25.95	28.77	31.60	34.43	37.23	39.98	42.67
15		16.94	19.85	22.98	26.28	29.71	33.23	36.78	40.32	43.82	47.23	50.54	53.72	56.76
20		22.99	26.59	30.40	34.35	38.38	42.43	46.45	50.39	54.19	57.84	61.30	64.56	67.60
25		29.24	33.39	37.69	42.08	46.48	50.83	55.06	59.12	62.97	66.59	69.96	73.06	75.90
30		35.67	40.21	44.83	49.47	54.03	58.46	62.68	66.67	70.37	73.78	76.89	79.71	82.23
35		42.27	47.03	51.80	56.50	61.04	65.36	69.42	73.16	76.59	79.68	82.44	84.89	87.04
40		49.02	53.84	58.58	63.17	67.52	71.59	75.34	78.74	81.79	84.49	86.86	88.91	90.68
45		55.88	60.59	65.14	69.46	73.49	77.19	80.53	83.51	86.13	88.40	90.36	92.02	93.43
50		62.83	67.26	71.46	75.37	78.96	82.19	85.05	87.56	89.72	91.56	93.11	94.41	95.49
55		69.77	73.76	77.46	80.85	83.90	86.59	88.94	90.95	92.66	94.08	95.26	96.23	97.01
60		76.58	79.97	83.06	85.84	88.28	90.41	92.22	93.75	95.01	96.05	96.90	97.58	98.12
65		83.04	85.72	88.12	90.23	92.05	93.60	94.90	95.97	96.85	97.55	98.11	98.55	98.90
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
BIRTH RATE		11.90	14.48	17.39	20.64	24.20	28.06	32.18	36.54	41.12	45.87	50.77	55.80	60.94
DEATH RATE		21.90	19.48	17.39	15.64	14.20	13.06	12.18	11.54	11.12	10.87	10.77	10.80	10.94
GRR (27)		0.930	1.065	1.218	1.392	1.589	1.812	2.065	2.350	2.673	3.036	3.446	3.908	4.428
GRR (29)		0.920	1.064	1.229	1.419	1.636	1.883	2.166	2.489	2.856	3.274	3.750	4.290	4.902
GRR (31)		0.911	1.064	1.242	1.447	1.685	1.959	2.276	2.640	3.060	3.543	4.097	4.733	5.461
GRR (33)		0.902	1.064	1.254	1.477	1.737	2.041	2.396	2.810	3.292	3.853	4.504	5.261	6.140
AVERAGE AGE		40.51	37.96	35.46	33.02	30.69	28.48	26.40	24.48	22.70	21.07	19.59	18.24	17.02
PROP. 15-44		38.94	40.74	42.17	43.19	43.78	43.97	43.76	43.19	42.31	41.17	39.82	38.30	36.67
BIRTHS/P. 15-44		0.031	0.036	0.041	0.048	0.055	0.064	0.074	0.085	0.097	0.111	0.128	0.146	0.166
POP. -4/15-44		0.141	0.162	0.186	0.213	0.244	0.278	0.316	0.359	0.408	0.462	0.522	0.589	0.664
POP. 5-14/5+OVR		0.121	0.142	0.164	0.188	0.213	0.239	0.266	0.294	0.321	0.348	0.376	0.402	0.428
DEPNDCY RATIO		0.677	0.663	0.664	0.679	0.707	0.749	0.804	0.872	0.953	1.048	1.157	1.280	1.418
POP. SIZE, B(0)=1		84.055	69.083	57.500	48.455	41.322	35.642	31.075	27.365	24.322	21.802	19.696	17.920	16.409

TABLE POPULATIONS
 PROPORTIONS OF DEATHS AT AGE(X), UP TO AGE(X), AND VARIOUS INDICES, AT GIVEN RATES OF POPULATION GROWTH

MODEL WEST
 FEMALES

MORTALITY LEVEL 15

AGE	R=	-10.00	-5.00	0.	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
0-1		4.48	6.10	8.18	10.76	13.86	17.44	21.42	25.66	30.00	34.26	38.32	42.08	45.49
1-4		2.12	2.86	3.78	4.91	6.25	7.77	9.42	11.15	12.87	14.52	16.03	17.39	18.56
5-9		0.69	0.90	1.17	1.48	1.84	2.24	2.66	3.07	3.47	3.83	4.13	4.38	4.57
10-14		0.55	0.71	0.89	1.11	1.34	1.59	1.84	2.08	2.29	2.46	2.59	2.68	2.73
15-19		0.83	1.04	1.28	1.54	1.83	2.11	2.38	2.62	2.81	2.95	3.03	3.06	3.04
20-24		1.13	1.37	1.65	1.95	2.25	2.53	2.79	2.99	3.13	3.20	3.21	3.16	3.06
25-29		1.33	1.59	1.86	2.14	2.40	2.64	2.84	2.97	3.03	3.03	2.96	2.84	2.68
30-34		1.56	1.82	2.07	2.33	2.55	2.74	2.87	2.93	2.91	2.84	2.70	2.53	2.33
35-39		1.84	2.08	2.32	2.54	2.72	2.84	2.90	2.89	2.81	2.66	2.48	2.26	2.03
40-44		2.19	2.41	2.62	2.80	2.92	2.98	2.97	2.88	2.73	2.53	2.29	2.04	1.79
45-49		2.72	2.93	3.10	3.22	3.28	3.27	3.17	3.00	2.78	2.51	2.22	1.92	1.64
50-54		3.74	3.93	4.06	4.12	4.09	3.97	3.76	3.47	3.13	2.76	2.38	2.01	1.68
55-59		5.08	5.21	5.25	5.19	5.03	4.76	4.40	3.96	3.48	2.99	2.52	2.08	1.69
60-64		7.36	7.35	7.23	6.97	6.59	6.08	5.48	4.81	4.13	3.46	2.84	2.28	1.81
65-69		10.05	9.79	9.39	8.84	8.14	7.33	6.44	5.52	4.61	3.77	3.02	2.37	1.83
70-74		13.28	12.62	11.80	10.83	9.73	8.55	7.32	6.12	4.99	3.98	3.10	2.38	1.79
75-79		15.15	14.04	12.81	11.46	10.05	8.61	7.19	5.86	4.66	3.62	2.76	2.06	1.52
80+		25.91	23.26	20.54	17.81	15.12	12.54	10.15	8.01	6.17	4.64	3.42	2.48	1.76
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1		4.48	6.10	8.18	10.76	13.86	17.44	21.42	25.66	30.00	34.26	38.32	42.08	45.49
5		6.60	8.96	11.96	15.67	20.11	25.21	30.85	36.81	42.86	48.78	54.36	59.47	64.05
10		7.29	9.86	13.13	17.15	21.95	27.45	33.51	39.88	46.33	52.60	58.49	63.85	68.62
15		7.84	10.57	14.02	18.26	23.30	29.05	35.35	41.96	48.62	55.07	61.08	66.54	71.35
20		8.67	11.60	15.30	19.81	25.12	31.16	37.73	44.58	51.44	58.02	64.12	69.59	74.39
25		9.79	12.98	16.95	21.75	27.37	33.69	40.51	47.57	54.57	61.22	67.32	72.75	77.45
30		11.13	14.57	18.81	23.89	29.77	36.33	43.35	50.54	57.60	64.25	70.28	75.59	80.13
35		12.69	16.38	20.88	26.21	32.33	39.07	46.22	53.47	60.51	67.08	72.99	78.12	82.46
40		14.53	18.47	23.20	28.75	35.04	41.91	49.12	56.36	63.32	69.75	75.46	80.38	84.49
45		16.72	20.88	25.83	31.55	37.96	44.89	52.09	59.24	66.05	72.27	77.75	82.42	86.27
50		19.44	23.81	28.93	34.77	41.25	48.16	55.26	62.24	68.82	74.78	79.97	84.34	87.92
55		23.18	27.73	32.98	38.89	45.34	52.13	59.02	65.71	71.95	77.54	82.35	86.35	89.59
60		28.26	32.94	38.23	44.09	50.37	56.89	63.42	69.68	75.44	80.53	84.86	88.43	91.28
65		35.62	40.29	45.46	51.06	56.96	62.98	68.90	74.49	79.56	83.98	87.70	90.72	93.09
70		45.66	50.08	54.85	59.89	65.10	70.31	75.34	80.01	84.18	87.76	90.72	93.08	94.93
75		58.94	62.70	66.65	70.72	74.83	78.85	82.66	86.13	89.17	91.73	93.82	95.46	96.72
80		74.09	76.74	79.46	82.19	84.88	87.46	89.85	91.99	93.83	95.36	96.58	97.52	98.24
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
BIRTH RATE		11.90	14.48	17.39	20.64	24.20	28.06	32.18	36.54	41.12	45.87	50.77	55.80	60.94
DEATH RATE		21.90	19.48	17.39	15.64	14.20	13.06	12.18	11.54	11.12	10.87	10.77	10.80	10.94
DR OVR AGE 1		21.09	18.52	16.24	14.24	12.52	11.07	9.85	8.85	8.04	7.39	6.87	6.47	6.17
DR OVR AGE 5		21.58	18.97	16.62	14.53	12.71	11.12	9.76	8.60	7.62	6.80	6.12	5.55	5.08
DR OVR AGE 65		82.89	81.35	79.84	78.37	76.93	75.54	74.18	72.87	71.59	70.36	69.16	68.00	66.88
AVG.A AT DEATH		64.03	61.02	57.50	53.47	48.98	44.14	39.11	34.09	29.27	24.81	20.83	17.38	14.47
AVG.A AT D.OVRS		68.48	66.93	65.18	63.23	61.07	58.71	56.14	53.41	50.53	47.56	44.55	41.56	38.65
DEATHS (30+/5+)		0.952	0.938	0.922	0.903	0.879	0.851	0.819	0.783	0.742	0.698	0.651	0.602	0.553
DEATHS (50+/5+)		0.863	0.837	0.807	0.773	0.735	0.693	0.647	0.598	0.546	0.492	0.439	0.386	0.336
DEATHS (65+/5+)		0.689	0.656	0.619	0.580	0.539	0.495	0.450	0.404	0.358	0.313	0.270	0.229	0.192

STABLE POPULATIONS

ONMS AT AGE(X), PROPORTIONS UP TO AGE(X), AND VARIOUS INDICES, AT GIVEN RATES OF POPULATION GROWTH

MORTALITY LEVEL 17

MODE
FEMA

-10.00	-5.00	0.	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
1.08	1.31	1.58	1.87	2.20	2.55	2.92	3.31	3.72	4.15	4.59	5.03	5.49
4.25	5.11	6.06	7.10	8.23	9.41	10.66	11.94	13.25	14.59	15.92	17.26	18.59
5.46	6.42	7.45	8.53	9.66	10.81	11.96	13.11	14.22	15.30	16.34	17.31	18.23
5.69	6.52	7.37	8.24	9.10	9.93	10.72	11.45	12.12	12.72	13.25	13.69	14.06
5.91	6.61	7.30	7.95	8.56	9.11	9.60	10.00	10.33	10.57	10.73	10.82	10.83
6.13	6.68	7.19	7.64	8.03	8.33	8.56	8.70	8.76	8.74	8.66	8.51	8.32
6.33	6.73	7.06	7.32	7.50	7.59	7.61	7.54	7.40	7.21	6.96	6.68	6.36
6.52	6.76	6.92	7.00	6.99	6.90	6.74	6.52	6.24	5.93	5.58	5.22	4.85
6.69	6.76	6.75	6.66	6.49	6.25	5.96	5.62	5.25	4.86	4.46	4.07	3.69
6.83	6.74	6.57	6.32	6.00	5.64	5.24	4.82	4.39	3.96	3.55	3.16	2.79
6.94	6.68	6.34	5.95	5.52	5.05	4.58	4.11	3.65	3.22	2.81	2.44	2.10
6.97	6.54	6.06	5.54	5.01	4.48	3.96	3.46	3.00	2.58	2.20	1.86	1.56
6.87	6.29	5.68	5.07	4.47	3.89	3.36	2.86	2.42	2.03	1.69	1.39	1.14
6.57	5.86	5.17	4.50	3.87	3.29	2.76	2.30	1.90	1.55	1.26	1.01	0.81
5.98	5.20	4.47	3.80	3.18	2.64	2.16	1.76	1.41	1.13	0.89	0.70	0.55
5.01	4.25	3.56	2.95	2.41	1.95	1.56	1.23	0.97	0.75	0.58	0.44	0.34
3.67	3.04	2.48	2.00	1.60	1.26	0.98	0.76	0.58	0.44	0.33	0.25	0.18
3.11	2.50	1.98	1.54	1.19	0.91	0.69	0.51	0.38	0.28	0.20	0.15	0.11
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1.08	1.31	1.58	1.87	2.20	2.55	2.92	3.31	3.72	4.15	4.59	5.03	5.49
5.33	6.42	7.64	8.98	10.42	11.96	13.57	15.25	16.98	18.73	20.51	22.29	24.07
10.79	12.84	15.09	17.51	20.08	22.77	25.54	28.36	31.20	34.04	36.85	39.61	42.31
16.48	19.36	22.46	25.75	29.18	32.70	36.26	39.81	43.33	46.76	50.09	53.30	56.35
22.39	25.97	29.76	33.70	37.74	41.81	45.85	49.81	53.65	57.33	60.82	64.12	67.20
28.52	32.65	36.95	41.35	45.77	50.14	54.41	58.51	62.41	66.07	69.48	72.63	75.51
34.85	39.38	44.01	48.67	53.27	57.74	62.01	66.05	69.81	73.28	76.44	79.31	81.88
41.36	46.14	50.93	55.67	60.26	64.64	68.76	72.57	76.06	79.21	82.03	84.53	86.73
48.05	52.90	57.69	62.33	66.75	70.89	74.71	78.18	81.30	84.07	86.49	88.60	90.42
54.89	59.64	64.25	68.64	72.75	76.53	79.95	83.00	85.69	88.03	90.04	91.76	93.21
61.83	66.32	70.60	74.60	78.27	81.58	84.53	87.11	89.34	91.25	92.85	94.20	95.31
68.80	72.86	76.66	80.14	83.28	86.06	88.49	90.57	92.34	93.82	95.05	96.06	96.88
75.67	79.15	82.34	85.21	87.75	89.95	91.84	93.44	94.76	95.85	96.74	97.45	98.02
82.24	85.01	87.51	89.71	91.61	93.24	94.61	95.74	96.66	97.40	98.00	98.46	98.83
100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
11.34	13.84	16.67	19.83	23.30	27.07	31.11	35.38	39.87	44.54	49.36	54.31	59.37
21.34	18.84	16.67	14.83	13.30	12.07	11.11	10.38	9.87	9.54	9.36	9.31	9.37
0.901	1.031	1.180	1.349	1.540	1.757	2.002	2.279	2.592	2.945	3.343	3.792	4.297
0.890	1.030	1.190	1.373	1.583	1.823	2.098	2.410	2.766	3.172	3.633	4.157	4.751
0.880	1.028	1.200	1.399	1.629	1.894	2.201	2.554	2.960	3.428	3.964	4.580	5.286
0.870	1.027	1.210	1.425	1.677	1.970	2.313	2.713	3.179	3.722	4.352	5.084	5.934
41.07	38.50	35.96	33.49	31.12	28.87	26.76	24.80	22.98	21.33	19.81	18.44	17.20
38.41	40.28	41.79	42.89	43.57	43.83	43.69	43.19	42.37	41.27	39.95	38.46	36.85
0.030	0.034	0.040	0.046	0.053	0.062	0.071	0.082	0.094	0.108	0.124	0.141	0.161
0.139	0.159	0.183	0.209	0.239	0.273	0.311	0.353	0.401	0.454	0.513	0.580	0.653
0.118	0.138	0.160	0.184	0.209	0.236	0.262	0.290	0.317	0.345	0.372	0.399	0.425
0.690	0.673	0.670	0.682	0.707	0.747	0.799	0.865	0.944	1.037	1.144	1.265	1.401
88.178	72.273	60.000	50.439	42.918	36.943	32.149	28.263	25.082	22.454	20.260	18.413	16.845

BII
DE.
DR
DR
DR
AV
AV
DE
DE
DE

MODEL WEST
FEMALES

MORTALITY LEVEL 17

AGE	R=	-10.00	-5.00	0.	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
0 -1		3.79	5.21	7.07	9.42	12.30	15.72	19.61	23.86	28.30	32.76	37.07	41.12	44.81
1 -4		1.69	2.30	3.08	4.05	5.23	6.60	8.13	9.77	11.45	13.09	14.63	16.02	17.24
5 -9		0.57	0.75	0.99	1.27	1.60	1.97	2.38	2.79	3.20	3.58	3.91	4.19	4.40
10-14		0.46	0.59	0.76	0.95	1.17	1.41	1.66	1.90	2.12	2.31	2.46	2.57	2.64
15-19		0.70	0.88	1.10	1.35	1.62	1.90	2.17	2.43	2.64	2.81	2.92	2.98	2.98
20-24		0.96	1.18	1.44	1.71	2.01	2.30	2.57	2.80	2.97	3.08	3.12	3.10	3.03
25-29		1.14	1.38	1.63	1.90	2.17	2.42	2.64	2.80	2.91	2.94	2.91	2.82	2.68
30-34		1.36	1.59	1.84	2.09	2.33	2.53	2.69	2.79	2.82	2.78	2.68	2.54	2.35
35-39		1.62	1.86	2.09	2.32	2.52	2.67	2.77	2.80	2.76	2.66	2.50	2.30	2.09
40-44		1.97	2.20	2.42	2.61	2.77	2.87	2.90	2.86	2.75	2.58	2.37	2.13	1.88
45-49		2.52	2.74	2.94	3.10	3.20	3.23	3.19	3.07	2.87	2.63	2.35	2.06	1.78
50-54		3.52	3.74	3.91	4.02	4.05	3.99	3.83	3.60	3.29	2.94	2.56	2.19	1.84
55-59		4.87	5.04	5.14	5.16	5.07	4.87	4.57	4.18	3.73	3.24	2.76	2.30	1.89
60-64		7.14	7.21	7.17	7.01	6.72	6.30	5.76	5.14	4.47	3.80	3.15	2.56	2.05
65-69		10.00	9.84	9.54	9.10	8.50	7.77	6.94	6.04	5.12	4.24	3.43	2.72	2.12
70-74		13.50	12.96	12.26	11.40	10.39	9.27	8.07	6.84	5.66	4.57	3.61	2.79	2.13
75-79		15.81	14.80	13.66	12.38	11.01	9.57	8.13	6.73	5.43	4.28	3.29	2.49	1.84
80+		28.38	25.72	22.97	20.16	17.35	14.61	12.00	9.61	7.51	5.73	4.27	3.12	2.24
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1		3.79	5.21	7.07	9.42	12.30	15.72	19.61	23.86	28.30	32.76	37.07	41.12	44.81
5		5.48	7.51	10.15	13.47	17.54	22.33	27.75	33.63	39.75	45.84	51.70	57.14	62.06
10		6.05	8.26	11.13	14.74	19.14	24.30	30.13	36.42	42.94	49.42	55.61	61.32	66.46
15		6.50	8.86	11.89	15.69	20.31	25.71	31.78	38.32	45.06	51.73	58.07	63.90	69.10
20		7.20	9.74	12.99	17.04	21.92	27.61	33.96	40.75	47.71	54.54	60.99	66.87	72.08
25		8.16	10.92	14.43	18.75	23.93	29.90	36.52	43.55	50.68	57.62	64.12	69.98	75.11
30		9.31	12.30	16.06	20.65	26.10	32.32	39.16	46.35	53.59	60.56	67.02	72.79	77.79
35		10.66	13.89	17.89	22.74	28.42	34.86	41.85	49.14	56.41	63.34	69.70	75.33	80.15
40		12.29	15.75	19.99	25.06	30.94	37.53	44.62	51.94	59.17	66.00	72.20	77.63	82.24
45		14.26	17.95	22.41	27.67	33.71	40.40	47.52	54.80	61.91	68.58	74.57	79.76	84.11
50		16.78	20.69	25.35	30.77	36.91	43.63	50.71	57.86	64.79	71.21	76.92	81.82	85.89
55		20.30	24.43	29.25	34.78	40.95	47.61	54.54	61.46	68.08	74.14	79.48	84.01	87.73
60		25.18	29.47	34.40	39.94	46.02	52.48	59.11	65.64	71.80	77.39	82.24	86.31	89.62
65		32.32	36.68	41.57	46.95	52.74	58.78	64.87	70.78	76.28	81.18	85.39	88.88	91.67
70		42.32	46.52	51.11	56.05	61.24	66.55	71.81	76.81	81.40	85.42	88.83	91.60	93.79
75		55.82	59.48	63.37	67.45	71.64	75.82	79.87	83.66	87.06	90.00	92.44	94.40	95.92
80		71.62	74.28	77.03	79.84	82.65	85.39	88.00	90.39	92.49	94.27	95.73	96.88	97.76
TOTAL		100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
BIRTH RATE		11.34	13.84	16.67	19.83	23.30	27.07	31.11	35.38	39.87	44.54	49.36	54.31	59.37
DEATH RATE		21.34	18.84	16.67	14.83	13.30	12.07	11.11	10.38	9.87	9.54	9.36	9.31	9.37
DR OVR AGE 1		20.69	18.07	15.74	13.70	11.94	10.44	9.19	8.15	7.30	6.62	6.08	5.66	5.33
DR OVR AGE 5		21.23	18.59	16.21	14.11	12.26	10.65	9.27	8.10	7.12	6.29	5.60	5.03	4.55
DR OVR AGE 65		81.03	79.47	77.95	76.47	75.02	73.62	72.25	70.92	69.63	68.38	67.17	66.00	64.87
AVG.A AT DEATH		65.96	63.23	60.00	56.24	51.97	47.27	42.26	37.14	32.10	27.34	23.02	19.22	15.97
AVG.A AT D.OVRS		69.73	68.29	66.67	64.86	62.84	60.60	58.15	55.51	52.69	49.75	46.73	43.68	40.67
DEATHS (30+/5+)		0.960	0.948	0.934	0.917	0.896	0.871	0.842	0.808	0.770	0.728	0.683	0.635	0.585
DEATHS (50+/5+)		0.880	0.858	0.831	0.800	0.765	0.726	0.682	0.635	0.584	0.532	0.478	0.424	0.372
DEATHS (65+/5+)		0.716	0.685	0.650	0.613	0.573	0.531	0.486	0.440	0.394	0.347	0.302	0.259	0.220

FEMALES

AGE (X)	1000 Q(X)	D(X)	1000 M(X)	L(X)	L(X)	P(X)	T(X)	E(X)	AGE (X)
0	81.77	8177	86.77	100000	94237.5	0.90332*	5749999.9	57.500	0
1	41.18	3781	10.58	91823	357423.9	0.96818**	5655762.4	61.594	1
5	13.26	1167	2.67	88041	437289.3	0.98821	5298338.4	60.180	5
10	10.29	894	2.07	86874	432135.7	0.98744	4861049.1	55.955	10
15	14.85	1277	2.99	85980	426708.2	0.98285	4420913.3	51.511	15
20	19.49	1651	3.94	84703	419389.3	0.97908	4002205.2	47.250	20
25	22.37	1858	4.53	83052	410616.7	0.97605	3582815.9	43.139	25
30	25.56	2075	5.18	81194	400783.9	0.97258	3172199.1	39.069	30
35	29.34	2321	5.95	79119	389793.7	0.96829	2771415.2	35.028	35
40	34.16	2624	6.95	76798	377432.0	0.96209	2381621.4	31.011	40
45	41.80	3100	8.54	74175	363122.3	0.95071	2004189.4	27.020	45
50	57.11	4059	11.76	71074	345223.4	0.93259	1641067.0	23.089	50
55	78.34	5250	16.31	67015	321950.5	0.90312	1295843.7	19.337	55
60	116.99	7226	24.85	61765	290761.2	0.85715	973893.2	15.768	60
65	172.15	9389	37.67	54539	249224.7	0.78746	683132.0	12.525	65
70	261.33	11799	60.12	45151	196255.4	0.68656	433907.2	9.610	70
75	383.99	12807	95.05	33352	134741.3	0.43303***	237651.9	7.126	75
80	1000.00	20545	199.64	20545	102911.0	0.	102910.5	5.009	80

MALES

AGE (X)	1000 Q(X)	D(X)	1000 M(X)	L(X)	L(X)	P(X)	T(X)	E(X)	AGE (X)
0	98.57	9857	105.59	100000	93355.2	0.88750*	5413729.2	54.137	0
1	42.70	3850	10.99	90143	350393.8	0.96562**	5320374.0	59.022	1
5	13.79	1190	2.78	86293	428490.7	0.98798	4969980.2	57.594	5
10	10.22	870	2.05	85103	423341.8	0.98706	4541489.5	53.365	10
15	15.68	1321	3.16	84234	417865.2	0.98107	4118147.7	48.890	15
20	22.22	1842	4.49	82912	409956.3	0.97692	3700282.5	44.629	20
25	23.96	1942	4.85	81070	400494.6	0.97438	3290326.2	40.586	25
30	27.32	2162	5.54	79128	390234.5	0.96987	2889831.6	36.521	30
35	33.01	2541	6.71	76966	378477.9	0.96246	2499597.1	32.477	35
40	42.22	3142	8.63	74425	364270.2	0.95141	2121119.2	28.500	40
45	55.24	3938	11.36	71283	346570.7	0.93452	1756848.9	24.646	45
50	76.33	5140	15.87	67345	323876.2	0.90957	1410278.2	20.941	50
55	105.71	6576	22.32	62205	294586.6	0.87248	1086401.9	17.465	55
60	151.91	8451	32.88	55629	257021.0	0.81901	791815.4	14.234	60
65	215.27	10156	48.25	47179	210503.7	0.74417	534794.4	11.335	65
70	307.51	11385	72.68	37023	156650.7	0.64084	324290.7	8.759	70
75	433.73	11120	110.77	25638	100388.8	0.40116***	167640.0	6.539	75
80	1000.00	14518	215.87	14518	67251.6	0.	67251.2	4.632	80

* P(BIRTH), ** P(0-4), *** T(80)/T(75)

LI TABLE

LEVEL 17

FE

	1000 Q(X)	D(X)	1000 M(X)	I(X)	L(X)	P(X)	T(X)	E(X)	AGE(X)
0	70.66	7066	74.54	100000	94785.3	0.91708*	6000000.0	60.000	0
1	33.15	3081	8.47	92934	363754.5	0.97441**	5905214.6	63.542	1
5	10.97	985	2.21	89854	446804.9	0.99024	5541460.1	61.672	5
0	8.54	759	1.71	88868	442444.7	0.98950	5094655.1	57.328	10
5	12.48	1099	2.51	88110	437800.0	0.98553	4652210.4	52.800	15
0	16.50	1435	3.33	87010	431463.4	0.98223	4214410.4	48.436	20
5	19.06	1631	3.85	85575	423798.1	0.97953	3782947.0	44.206	25
0	21.90	1839	4.43	83944	415124.5	0.97633	3359148.9	40.016	30
5	25.47	2092	5.16	82106	405299.1	0.97218	2944024.4	35.857	35
0	30.24	2419	6.14	80014	394021.8	0.96600	2538725.3	31.728	40
5	37.89	2940	7.72	77595	380623.3	0.95502	2144703.5	27.640	45
0	52.34	3908	10.75	74655	363504.0	0.93775	1764080.1	23.630	50
5	72.70	5144	15.09	70747	340876.1	0.90968	1400576.1	19.797	55
0	109.32	7172	23.13	65603	310088.1	0.86524	1059700.0	16.153	60
5	163.33	9544	35.57	58432	268299.6	0.79681	749611.9	12.829	65
0	250.82	12262	57.36	48888	213784.6	0.69691	481312.3	9.845	70
5	372.85	13656	91.66	36626	148989.3	0.44309***	267527.7	7.304	75
0	1000.00	22970	193.78	22970	118538.8	0.	118538.4	5.161	80

	1000 Q(X)	D(X)	1000 M(X)	I(X)	L(X)	P(X)	T(X)	E(X)	AGE(X)
	86.21	8621	91.83	100000	93882.1	0.90214*	5647390.1	56.474	0
	34.96	3195	8.94	91379	357189.0	0.97174**	5553507.9	60.775	1
	11.79	1040	2.37	88184	438322.5	0.98969	5196318.9	58.926	5
	8.81	768	1.77	87145	433804.5	0.98872	4757996.4	54.599	10
	13.78	1190	2.78	86377	428909.5	0.98338	4324191.9	50.062	15
	19.50	1661	3.94	85187	421781.2	0.97982	3895282.3	45.726	20
	20.87	1743	4.22	83526	413270.5	0.97770	3473501.1	41.586	25
	23.76	1943	4.81	81782	404054.6	0.97370	3060230.6	37.419	30
	28.90	2307	5.86	79839	393429.0	0.96688	2656176.0	33.269	35
	37.47	2905	7.64	77532	380399.0	0.95632	2262746.9	29.185	40
	50.13	3741	10.28	74627	363783.1	0.93998	1882347.9	25.223	45
	70.42	4992	14.60	70886	341950.3	0.91563	1518564.8	21.423	50
	99.38	6548	20.91	65894	313100.1	0.87938	1176614.5	17.856	55
	144.21	8558	31.08	59346	275333.4	0.82702	863514.4	14.551	60
	206.59	10492	46.08	50788	227706.4	0.75305	588180.9	11.581	65
	297.81	12000	69.98	40295	171474.4	0.65050	360474.5	8.946	70
	423.10	11972	107.33	28295	111544.5	0.40982***	189000.1	6.680	75
	1000.00	16323	210.74	16323	77456.2	0.	77455.7	4.745	80

** P(0-4), *** T(80)/T(75)