NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY

FACULTY OF HEALTH, NATURAL RESOURCES AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND STATISTICS

QUALIFICATION: Bachelor of science in Applied Mathematics and Statistics	
QUALIFICATION CODE: 07BSAM	**LEVEL: 6**
COURSE CODE: DEM602S	**COURSE NAME:** DEMOGRAPHY
SESSION: NOVEMBER 2022	**PAPER:** THEORY
DURATION: 3 HOURS	**MARKS: 80**

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
EXAMINER	MR. ROUX, AJ
MODERATOR:	Mr SWARTZ, J

INSTRUCTIONS
1. Answer ALL the questions in the booklet provided. 2. Show clearly all the steps used in the calculations. 3. All written work must be done in blue or black ink and sketches must be done in pencil.

PERMISSIBLE MATERIALS

1. Non-programmable calculator without a cover.

THIS QUESTION PAPER CONSISTS OF 4 PAGES (Including this front page)

QUESTION 1 : Introduction to Demography [30]

1.1) State and explain the variables use in the equations used to calculate

1.1.1) Crude birth rate (3)
1.1.2) Crude death rate (3)
1.1.3) Crude migration rate (3)

1.2) State the balancing formula which is used to express population growth. (identify all variables in the formula) (3)

1.3) Use the data provided to calculate and interpret the following:

Age	Male	Male (%)	Female	Female (%)	Total
0--4	829	6.1	773	5.69	1602
5--9	724	5.33	663	4.88	1387
10--14	701	5.16	732	5.39	1433
15--19	761	5.6	744	5.48	1505
20--24	631	4.64	632	4.65	1263
25--29	449	3.3	477	3.51	926
30--34	372	2.74	384	2.83	756
35--39	358	2.64	382	2.81	740
40--44	398	2.93	390	2.87	788
45--49	390	2.87	378	2.78	768
50--54	329	2.42	343	2.52	672
55--59	246	1.81	304	2.24	550
60--64	185	1.36	212	1.56	397
65--69	124	0.91	188	1.38	312
70--74	84	0.62	115	0.85	199
75--79	64	0.47	76	0.56	140
80--84	36	0.26	55	0.4	91
85+	20	0.15	37	0.27	57
Total	6701	49.32	6885	50.68	13586

1.3.1) Child-Dependency Ratio (3)

1.3.2) Age Dependency Ratio (3)

1.3.3) Total Dependency Ratio (3)

1.3.4) Gender Ratio (3)

1.3.5) The median age of the population (6)

QUESTION 2 : Mortality [24]

Consult the abridged life table provided below, and give the following answers, A – H (8 x 3 = 24)

Age	Pop size nPx	Deaths nDx	nMx	nqx	lx	ndx	nLx	Tx	ex
0	5923	171	0.02887	0.028179	**C**	2817.899	97604.79	5851744	58.5174
1 to 4	24683	35	**A**	0.001413	97182.1	137.3349	388398.8	5754139	59.2099
5 to 9	32182	15	0.00047	0.001862	97044.77	180.7193	484772	5365741	55.2914
10 to 14	31275	26	0.00083	0.004148	96864.05	401.7973	483315.7	4880969	50.3899
15 to 19	30878	70	0.00227	**B**	96462.25	1087.231	479593.2	4397653	45.5894
20 to 24	35736	108	0.00302	0.014998	95375.02	1430.387	473299.1	3918060	41.0806
25 to 29	37549	162	0.00431	0.021342	93944.63	2004.931	464710.8	3444761	36.668
30 to 34	43641	201	0.00461	0.022767	**D**	2093.16	454465.6	2980050	32.41309
35 to 39	39540	213	0.00539	0.026577	89846.54	2387.836	443263.1	2525584	28.10998
40 to 44	33545	270	0.00805	0.039451	87458.7	3450.3	428667.8	2082321	23.80919
45 to 49	32117	421	0.01311	0.063462	84008.4	**E**	406713.7	1653653	19.68438
50 to 54	33294	643	0.01931	0.092116	78677.07	7247.447	375266.7	1246940	15.84883
55 to 59	25660	965	0.03761	0.171876	71429.62	12277.07	326455.5	871672.8	12.20324
60 to 64	22281	1324	0.05942	0.258685	59152.56	15301.86	**F**	545217.4	9.217139
65 to 69	20561	2229	0.10841	0.426464	43850.7	18700.75	172501.6	287709.2	6.56111
70 to 74	17737	3287	0.18532	0.633224	25149.95	15925.54	85935.89	**G**	4.58083
75 to 79	14607	4338	0.29698	0.852192	9224.409	7860.971	26469.62	29271.73	**H**
80 to 84	7844	4018	0.51224	1.123037	1363.438	1531.191	2989.214	2802.116	2.055184
85+	5600	5021	0.89661	1	-167.753	-167.753	-187.098	-187.098	1.115318
TOTAL	494653	23517							
	Live births	29558							

QUESTION 3 : Fertility [26]

Consider the data provided in the table and answer the questions below:

Age of Women	B	P_W
15-19	4380	123039
20-24	25787	139007
25-29	23608	165318
30-34	11556	160892
35-39	3845	124196
40-44	662	94196
45 - 49	86	7455

Source: U.N. Demographic Yearbook, 1989

3.1) Calculate and interpret the General fertility rate (3)

3.2) Calculate all Age-specific fertility rates (3)

3.3) Calculate and interpret the Total Fertility Rate. (3)

3.4) Calculate the Mean of Age of Childbearing (8)

3.5) Calculate the Variance of Age of Childbearing (6)

3.6) Calculate and interpret the coefficient of variation of Age of Childbearing (3)

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