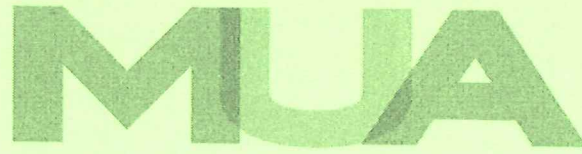


The
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UNDERGRADUATE UNIVERSITY EXAMINATIONS
SCHOOL OF MANAGEMENT AND LEADERSHIP
DEGREE OF BACHELOR OF COMMERCE

INS 311: FUNDAMENTALS OF ACTUARIAL SCIENCE

DATE: 5TH AUGUST 2024

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **THREE** questions.
6. Question **ONE** carries **25 MARKS** and the rest carry **15 MARKS** each.
7. Write all your answers in the Examination answer booklet provided.

QUESTION SIX

- a) Define the term mortality as used in actuarial science (2 Marks)
- b) Assume at age 40 there are 9,241,359 people living and that 30,622 of them will die by the end of the year. Compute the number of deaths per thousand (3 Marks)
- c) Discuss five factors that affect mortality (10 Marks)

Mortality table

(Men)					Women				
Age	Number Alive	Number Dying	Deaths per 1000	Life Expecta ncy	Age	Number Alive	No. Dying	Death per 1000	Life Expectancy
0	10,000,000	41,800	4.18	70.83	0	10,000,000	28,900	2.89	75.83
1	9,958,200	10,655	1.07	70.13	1	9,971,100	8,675	0.87	75.04
2	9,9947,545	9,848	0.99	69.20	2	9,962,425	8,070	0.81	74.11
3	9,937,697	9,739	0.98	68.27	3	9,954,355	7,864	0.79	73.17
4	9,927,958	9,432	0.95	67.34	4	9,946,491	7,659	0.77	72.23
5	9,918,526	8,927	0.90	66.40	5	9,938,832	7,554	0.76	71.28
6	9,909,599	8,522	0.86	65.46	6	9,931,278	7,250	0.73	70.34
7	9,901,077	7,921	0.80	64.52	7	9,924,028	7,145	0.72	69.39
8	9,893,156	7,519	0.76	63.57	8	9,916,883	6,942	0.70	68.44
9	9,885,637	7,315	0.74	62.62	9	9,909,941	6,838	0.69	67.48
10	9,878,322	7,211	0.73	61.66	10	9,903,103	6,734	0.68	66.53
11	9,871,111	7,601	0.77	60.71	11	9,896,369	6,828	0.69	65.58
12	9,863,510	8,384	0.85	59.75	12	9,889,541	7,120	0.72	64.62
13	9,855,126	9,757	0.99	58.80	13	9,882,421	7,412	0.75	63.67
14	9,845,369	11,322	1.15	57.86	14	9,875,009	7,900	0.80	62.71
15	9,834,047	13,079	1.33	56.93	15	9,867,109	8,387	0.85	61.76
16	9,820,968	14,830	1.51	56.00	16	9,858,722	8,873	0.90	60.82
17	9,806,138	16,376	1.67	55.09	17	9,849,849	9,357	0.95	59.87
18	9,789,762	17,426	1.78	54.18	18	9,840,492	9,644	0.98	58.93
19	9,772,336	18,177	1.86	53.27	19	9,830,848	10,027	1.02	57.98
20	9,754,159	18,533	1.90	52.37	20	9,820,821	10,312	1.05	57.04
21	9,735,626	18,595	1.91	51.47	21	9,810,509	10,497	1.07	56.10
22	9,717,031	18,365	1.89	50.57	22	9,800,012	10,682	1.09	55.16

Age	Number Alive	Number Dying	Death per 1000	Life Expectancy	Age	Number Alive	Number Dying	Death per 1000	Life Expectancy
23	9,698,666	18,040	1.86	49.66	23	9,789,330	10,866	1.11	54.22
24	9,680,626	17,619	1.82	48.75	24	9,778,464	11,147	1.14	53.28
25	9,663,007	17,104	1.77	47.84	25	9,767,317	11,330	1.16	52.34
26	9,645,903	16,687	1.73	46.93	26	9,755,987	11,610	1.19	51.40
27	9,629,216	16,466	1.71	46.01	27	9,744,377	11,888	1.22	50.46
28	9,612,750	16,342	1.70	45.09	28	9,732,489	12,263	1.26	49.52
29	9,596,408	16,410	1.71	44.16	29	9,720,226	12,636	1.30	48.59
30	9,579,998	16,573	1.73	43.24	30	9,707,590	13,105	1.35	47.65
31	9,563,425	17,023	1.78	42.31	31	9,694,485	13,572	1.40	46.71
32	9,546,402	17,470	1.83	41.38	32	9,680,913	14,037	1.45	45.78
33	9,528,932	18,200	1.91	40.46	33	9,666,976	14,500	1.50	44.84
34	9,510,732	19,021	2.00	39.54	34	9,652,376	15,251	1.58	43.91
35	9,491,711	20,028	2.11	38.61	35	9,637,125	15,901	1.65	42.98
36	9,471,683	21,217	2.24	37.69	36	9,621,224	16,933	1.76	42.05
37	9,450,466	22,681	2.40	36.78	37	9,604,291	18,152	1.89	41.12
38	9,427,785	24,324	2.58	35.87	38	9,586,139	19,556	2.04	40.20
39	9,403,461	26,236	2.79	34.96	39	9,566,583	21,238	2.22	39.28
40	9,377,225	28,319	3.02	34.05	40	9,545,345	23,100	2.42	38.36
41	9,348,906	30,758	3.29	33.16	41	9,522,245	25,139	2.64	37.46
42	9,284,975	35,933	3.87	32.26	42	9,497,106	27,257	2.87	36.55
43	9,284,975	35,933	3.87	31.38	43	9,469,849	29,262	3.09	35.66
44	9,249,042	38,753	4.19	30.50	44	9,440,587	31,343	3.32	34.77
45	9,210,289	41,907	4.55	29.62	45	9,409,244	33,497	3.56	33.88
46	9,168,382	45,108	4.92	28.76	46	9,375,747	35,628	3.80	33.00
47	9,123,274	48,536	5.32	27.90	47	9,340,119	37,827	4.05	32.12
48	9,074,738	52,089	5.74	27.04	48	9,302,292	40,279	4.33	31.25
49	9,022,649	56,031	6.21	26.20	49	9,262,013	42,883	4.63	30.39
50	8,966,618	60,166	6.71	25.36	50	9,219,130	45,727	4.96	29.53