Q.1

You are given

${}_{10}p_x = 0.9$ ${}_{15}p_x = 0.85$ ${}_{5}p_{x+5} = 0.95$

Calculate ${}_{5}q_x$, ${}_{10|5}q_x$, ${}_{10}p_{x+5}$

Q.2 We call K_x the curtate future life time random variable

You are give $q_{x+k} = 0.1(k+1)$

$k = 0, 1, 2, \ldots, 9$

Calculate $Pr(K_x = 1)$, $Pr(K_x = 0)$

Q.3 The prob. density function for the future life time of a life age 0 is given by

$$f_0(t) = \frac{\alpha \beta^\alpha}{(\beta + t)^{\alpha+1}} \; ; \quad \alpha, \beta > 0$$

a) show that $S_0(t) = \left(\frac{\beta}{\beta + t}\right)^\alpha$

b) $\mu_x = ?$

c) $S_x(t) = ?$

Q: 4

You are given $\mu_x = \begin{cases} 0.02 & 0 < x < 50 \\ 0.04 & x \geq 50 \end{cases}$

Calculate the prob. that (30) will live another 15 years

Q: 5

x	$q_{[x]}$	$q_{[x]+1}$	$q_{[x]+2}$	$x+2$
65	0.01	0.04	0.07	67
66	0.03	0.06	0.09	68
67	0.05	0.08	0.10	69

a) State the select period

b) $_{1|2}q_{[65]+1}$

c) $_{0.4|}p_{[65]+0.3}$

Q: 6 You are given

$\mu_x = \frac{2x}{400 - x^2}$ $\quad 0 \leq x < 20$

Var(T0)

x	L_x	x	L_x	x	L_x
91	27	44	12	97	3
92	21	95	8	98	1
93	16	96	5	91	0

a) e_{31}

b) e°_{91}

c) ${}_tp_{91}$