

# List of Tables

2.1	Steady state queue length distribution of $M/M^{15}/1$ queue with balking for <i>Case 1</i> , <i>Case 2</i> and <i>Case 3</i>	40
3.1	Joint distribution of queue and server content of $M/M^{(5,10)}/1$ queue with balk- ing for Case 1 with parameters $\lambda = 5.25$ , $\mu = 0.5$ , $\beta = 0.75$ , $\beta'_i = 1.1 - (5 - i) * 0.1$ ; $0 \leq i \leq 3$ , $\rho = 0.7875$ .	62
3.2	Joint distribution of queue and server content of $M/M^{(17,25)}/1$ queue with balking for Case 2 with parameters $\lambda = 11.5$ , $\mu = 0.5$ , $\beta = 0.75$ , $\beta'_i = 1.05 - (17 - i) * 0.05$ ; $0 \leq i \leq 15$ , $\beta_i = 0.95 - (25 - i) * 0.03$ ; $0 \leq i \leq 24$ , $\rho = 0.69$ .	63
3.3	Performance measures of $M/M^{(a,b)}/1$ queue with balking for Case 2 with parameters $\lambda = 6.5$ , $\mu = 0.5$ , $\beta = 0.75$ , $\beta'_i = 1.05 - (a - i) * 0.05$ ; $0 \leq i \leq a - 2$ , $\beta_i = 0.95 - (b - i) * 0.03$ ; $0 \leq i \leq b - 1$	64
4.1	Service and vacation rates for Table 4.2-4.5	89
4.2	Joint distributions at departure epoch for $M/G_r^{(4,7)}/1/15$ queue with SV, $E_2$ STD, deterministic VTD and $\lambda = 2.1$ .	91
4.3	Joint distributions at arbitrary epoch for $M/G_r^{(4,7)}/1/15$ queue with SV, $E_2$ STD, deterministic VTD and $\lambda = 2.1$ .	92
4.4	Joint distributions at departure epoch for $M/G_r^{(4,7)}/1/15$ queue with MV, $E_2$ STD, deterministic VTD and $\lambda = 2.1$ .	93
4.5	Joint distributions at arbitrary epoch for $M/G_r^{(4,7)}/1/15$ queue with MV, $E_2$ STD, deterministic VTD and $\lambda = 2.1$ .	94
4.6	Service and vacation rates for Figure 4.1-4.4.	95

4.7	Performance measures corresponding to different values of $\lambda$ for $M/G_r^{(10,16)}/1/20$ with SV, $STD \sim Exponential$ and $VTD \sim E_4$ for Case 1 and Case 2 . . . . .	98
4.8	Performance measures corresponding to different values of $\lambda$ for $M/G_r^{(10,16)}/1/20$ with MV, $STD \sim Exponential$ and $VTD \sim E_4$ for Case 1 and Case 2 . . . . .	99
5.1	Service and vacation rates for Table 5.2-Table 5.7 . . . . .	127
5.2	Joint distributions at service/vacation completion epoch for $M^X/G_r^{(4,7)}/1/18$ queue with SV, $E_4$ STD, deterministic VTD, $\lambda = 1.0$ and $g_i = 0.1 (1 \leq i \leq 10)$ . . . . .	128
5.3	Joint distributions at arbitrary epoch for $M^X/G_r^{(4,7)}/1/18$ queue with SV, $E_4$ STD, deterministic VTD, $\lambda = 1.0$ and $g_i = 0.1 (1 \leq i \leq 10)$ . . . . .	129
5.4	Joint distributions at pre-arrival epoch for $M^X/G_r^{(4,7)}/1/18$ queue with SV, $E_4$ STD, deterministic VTD, $\lambda = 1.0$ and $g_i = 0.1 (1 \leq i \leq 10)$ . . . . .	130
5.5	Joint distributions at service/vacation completion epoch for $M^X/G_r^{(4,7)}/1/18$ queue with MV, $E_4$ STD, deterministic VTD, $\lambda = 1.0$ and $g_i = 0.1 (1 \leq i \leq 10)$ . . . . .	131
5.6	Joint distributions at arbitrary epoch for $M^X/G_r^{(4,7)}/1/18$ queue with MV, $E_4$ STD, deterministic VTD, $\lambda = 1.0$ and $g_i = 0.1 (1 \leq i \leq 10)$ . . . . .	132
5.7	Joint distributions at pre-arrival epoch for $M^X/G_r^{(4,7)}/1/18$ queue with MV, $E_4$ STD, deterministic VTD, $\lambda = 1.0$ and $g_i = 0.1 (1 \leq i \leq 10)$ . . . . .	133
6.1	Service completion epoch joint distributions for SV . . . . .	175
6.2	Arbitrary epoch joint distributions for SV when server is busy . . . . .	176
6.3	Vacation completion epoch joint distributions for SV . . . . .	177
6.4	Arbitrary epoch joint distributions for SV when server is in vacation . . . . .	178
6.5	Service completion epoch joint distributions for MV . . . . .	179
6.6	Arbitrary epoch joint distributions for MV when server is busy . . . . .	180
6.7	Vacation completion epoch joint distributions for MV . . . . .	181
6.8	Arbitrary epoch joint distributions for MV when server is in vacation . . . . .	182
6.9	Mean service time and mean vacation time for Figs. 6.1-6.6 . . . . .	183