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Example 07: The News Dealer's Problem

A news dealer buys papers for 33 cents each and sells them for 50 cents each. Newspapers not sold at the end of the day are sold as scrap for 5 cents each. Newspapers can be purchased in bundles of 10. Thus, the newsstand can buy 50 or 60 or 70 papers, and so on. The order quantity,  $Q$ , is the only policy decision. Unlike some inventory problems, the order quantity  $Q$  is fixed since ending inventory is always zero due to scrapping leftover papers.

Table 16	Distribution of daily newspaper demand, by type of newscard					
Distribution of Newspapers Demanded						
Demand	Demand Probabilities			Cumulative Probabilities		
	Good	Fair	Poor	Good	Fair	Poor
40	0.030	0.100	0.440	0.030	0.100	0.440
50	0.050	0.180	0.220	0.080	0.280	0.660
60	0.150	0.400	0.160	0.230	0.680	0.820
70	0.200	0.200	0.120	0.430	0.880	0.940
80	0.350	0.080	0.060	0.780	0.960	1.000
90	0.150	0.040	0.000	0.930	1.000	1.000
100	0.070	0.070	0.000	1.000	1.000	1.000

Table 17	Distribution of Type of Newscard	
Type	Probability	Cumulative Probability
Good	0.350	0.350
Fair	0.450	0.800
Poor	0.200	1.000

Day	Order quantity Q is Fixed	Random # 1	Type of Newsday	Random # 2	Demanded	Revenue from Sales	Lost Profit from Excess Demand	Salvage from Sale of Scrap	Daily Cost	Daily Profit
1	70	0.262	Good	0.563	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
2	70	0.061	Good	0.642	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
3	70	0.423	Fair	0.112	50	\$ 25.0	\$ -	\$ 1.0	\$ 23.1	\$ 2.9
4	70	0.737	Fair	0.833	70	\$ 35.0	\$ -	\$ -	\$ 23.1	\$ 11.9
5	70	0.112	Good	0.027	40	\$ 20.0	\$ -	\$ 1.5	\$ 23.1	\$ (1.6)
6	70	0.940	Poor	0.780	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
7	70	0.760	Fair	0.880	70	\$ 35.0	\$ -	\$ -	\$ 23.1	\$ 11.9
8	70	0.231	Good	0.813	90	\$ 35.0	\$ 4.4	\$ -	\$ 23.1	\$ 7.5
9	70	0.486	Fair	0.932	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
10	70	0.914	Poor	0.350	40	\$ 20.0	\$ -	\$ 1.5	\$ 23.1	\$ (1.6)
11	70	0.612	Fair	0.195	50	\$ 25.0	\$ -	\$ 1.0	\$ 23.1	\$ 2.9
12	70	0.908	Poor	0.556	50	\$ 25.0	\$ -	\$ 1.0	\$ 23.1	\$ 2.9
13	70	0.840	Poor	0.964	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
14	70	0.958	Poor	0.931	70	\$ 35.0	\$ -	\$ -	\$ 23.1	\$ 11.9
15	70	0.688	Fair	0.917	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
16	70	0.094	Good	0.766	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
17	70	0.396	Fair	0.632	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
18	70	0.888	Poor	0.659	50	\$ 25.0	\$ -	\$ 1.0	\$ 23.1	\$ 2.9
19	70	0.589	Fair	0.464	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
20	70	0.195	Good	0.086	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
21	70	0.253	Good	0.966	100	\$ 35.0	\$ 6.6	\$ -	\$ 23.1	\$ 5.3
22	70	0.855	Poor	0.723	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
23	70	0.304	Good	0.606	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
24	70	0.830	Poor	0.739	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
25	70	0.326	Good	0.524	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
26	70	0.302	Good	0.998	100	\$ 35.0	\$ 6.6	\$ -	\$ 23.1	\$ 5.3
27	70	0.404	Fair	0.329	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
28	70	0.412	Fair	0.359	60	\$ 30.0	\$ -	\$ 0.5	\$ 23.1	\$ 7.4
29	70	0.196	Good	0.579	80	\$ 35.0	\$ 2.2	\$ -	\$ 23.1	\$ 9.7
									Total Profit	\$ 208.70