

Index

A

- ABC classification
 - advantage, 213
 - annual usage value, 212–214
 - data for practice problem, 229
 - description, 212
 - limitations, 214
 - on Pareto's theory, 212
 - rank-ordering, 216
 - sales data, 215
 - sample items, at Rosettas, 212, 213
 - strategy, 212
- Adequate warning, 252, 256

B

- Binny foods manufactures, 87
- Budget constraint
 - function, 183
 - inventory parameters, 185
 - investment, 186
- Budgetary and Space Constraint, 197–199
- Buffer Inventory, 6

C

- Closeness factor, 92
- Compute order size, 67, 73
- Continuous review system, 15
- Continuous review-based inventory control system, 16
- Continuous review-based inventory system, 146
- Coordinated replenishment, 199–203
- Coordinated replenishment process

assumptions, 200

costs, 199–200

Cost curve, 65

Critical ratio, 237–239, 242, 244, 246, 249

Cycle inventory, 5–6

Cycle service level, 147, 155, 156, 161, 162, 165, 174, 175

D

Decaying inventory items, 234

Decoupling inventory, 5

Design factors

carrying cost, 19

inventory costs, 17–24

management under constraints, 27–28

production Infrastructure, 29

replenishment order, 14

shortage cost, 23

timing of order, 14

uncertain demand, 27

Discount schedule, 67, 70

Dynamic inventory control models

EOQ, 64

E

Economic Order Quantity (EOQ) policy, 141

Economic Order Quantity (EOQ) model, 48

annual purchasing cost, 38

assumptions, 36

average inventory level, 41

computation, 39–43

derivation, 36–38

gradual supply, 45

- Economic Order Quantity (EOQ) model (*cont.*)
 order cost, 40
 physical dimensions, 38
 shortage cost, 49
 TIC, 36, 48
 inventory investment, 182
 formula, 91
- Exchange curve
 demand and purchase price, 217
 for items, at Rosetta's, 218, 219
 hyperbolic curve, 218
 for multi-item management, 223–226
 multi-item inventory systems, 217
 sample calculation, 218
 value of items, in inventory, 217
- F**
 Fast-moving items, 252
 Fast-moving spares, 263
 Feasibility, 68, 71
 Feasibility check, 68, 70, 73, 81
 Fill rate, 147, 156, 157, 159–162, 177
 Fixed order quantity, 15, 18, 30
 Fixed order quantity system, 57–58
 Fractional horsepower (FHP) motors, 173
- G**
 GOAL SEEK, 191, 225, 228
 GOAL SEEK window, 209
 Gradual replenishments, 45–48
 Gradual Supply Model, 72–74
- I**
 Incremental discount, 74, 78
 Incremental discount – cost function, 76
 Incremental discount model, 74–79
 incremental discount problem, 76
 Incremental discount solutions procedure, 79
 Indifference curves, 258, 259
 Instantaneous supply model, 67–69
 Interacting inventory items, 182
 Inventory
 APICS dictionary, 4
 examples, 4
 functions, 5–6
 management, 7
 organizations treat, 4
 carrying rate, 200
 control policy, 44
 control systems, 15–18
 data, 30, 189, 191, 194, 196, 206
 holding cost, 75
 items, 234
 model, 45, 51
 parameters, 207
 iteration, 92
- J**
 Joint replenishment, 203–206
- L**
 Lagrangean function, 193
 Least unit cost method
 April–May–June order horizon, unit costs for, 124
 beginning of April, 124
 beginning of January, 117
 beginning of June, 125
 beginning of March, 120
 demand for April, 122, 123
 demand for January, 118
 demand for June, 125
 demand for March and April, 121
 January–February–March order horizon, 120
 least unit cost, for order horizon, 117
 March–April order horizon, unit costs for, 122
 monthly demand for item, 126
 per unit cost (PUC), 118
 Rosetta's inventory problem, 117
 solution process, 125
 total inventory cost, 116
 Leon Cardiology Centre, 40
 Lot for lot method
 demand for corn flour additive, 93
 description, 93
 holding cost, 95
 monthly demand, item, 95
 solution process, 93
 total inventory costs, 94
 Lot sizing heuristic, 95, 104, 116, 127
 application, 92
 assumptions, 92
 corn flour additive, 91
 least unit cost (*see* Least unit cost method)
 lot-for-lot, 93, 95
 PPB (*see* Part-Period Balancing (PPB))
 promantia LLP, 137
 silver-meal heuristic (*see* Silver-meal heuristic)

- terminologies, 92
 - Wagner-Whitin (*see* Wagner-Whitin lot-sizing method)
- M**
- Maintenance inventories, 255–258
 - classification, 252
 - equipment, 251
 - fast-moving items, 253, 254
 - rotables, 260–262
 - slow-moving items
 - adequate warning, 256
 - analytical method, 256, 257
 - graphical method, 258
 - inadequate warning, 256
 - special items, 255
 - thermal power plant, 264
 - Maintenance, Repair and Operating (MRO) supplies, 3
 - Minimum acceptable discount price, 66
 - Mircoturbines sources, 79
 - Multiechelon
 - definition, 267
 - inventory analysis, 276
 - multi-echelon system, 268
 - for repairable items, 275
 - Multi-echelon inventory system, 268
 - Multi-item inventory models, 182
 - Multiple constraints, 196–199
 - Multiple price-break model, 69
 - Multiproduct inventory system, 211
- N**
- Normal distribution functions in MS Excel, 156
- O**
- Obsolete inventory items, 234, 235
 - Optimal order quantity, 83, 86
 - Optimal order size, 69
 - Order horizon, 92
 - Order quantities, 68, 70, 81
 - Ordering cost, 21
 - calculation, 23
 - Orders constraint, 192–196
 - space and number, 197
 - budgetary and number, 197
 - Overage cost, 236–238, 243, 250
- P**
- Part period balancing (PPB)
 - April–May order horizon, 103
 - cost parameters, 96
 - cost, type of, 97
 - demand for April, 101, 102
 - demand for February, 98
 - demand for March, 100
 - description, 95, 96
 - February–March order horizon, 98, 99
 - holding and order cost, 97
 - January–Febuary order horizon, 98
 - lot-sizing problem, 103, 104
 - March–April order horizon, 101
 - monthly demand, 103
 - total holding cost, 96
 - Periodic review models, 54–56
 - constant demand and variable lead time, 170, 171
 - lead time and variable demand and, 171, 172
 - on-hand inventory, 166
 - variable demand and constant lead time, 167–169
 - Periodic review system, 13
 - Periodic review-based inventory control system, 16
 - Perishable items
 - beginning inventory, 247
 - classes, inventory problem, 233
 - classification, 235
 - decaying Inventory Items, 234
 - deterministic demand, 235
 - graphical method, 246, 247
 - mathematical complexity, 235
 - obsolete inventory items, 234, 235
 - probable lifetimes, 234
 - Pipeline inventory, 6
 - Planning Horizon, 92
 - Point-of-Sale (POS) system, 13
 - Poisson distribution, 239, 243, 244
 - Probability distributions, 148, 150, 152, 173
 - Project Charter, 142
 - Promantia LLP, 137
 - course, 137
 - description, 137
 - optimization, 138–140
 - ordering course material, 138
 - training calendar, 138
 - Proportionality assumption, 189

R

- Raw materials, 3
- Real Great Foods (RGF), 273
- Reorder level, 15, 16
 - demand period and lead time, 157–162
 - normal distribution functions in MS
 - Excel, 156
 - planned shortages allowed, 165, 166
 - variable demand and constant lead time, 155
 - variable demand and lead time, 164, 165
 - variable lead time and constant demand, 163, 164
- Replenishment policy, 44, 55
- Retailers, 29–30
- Rosetta's order quantity problem, 47
- Rosetta's vegetable oil ordering problem, 47
- Rotables, 252, 260–263, 265

S

- Safety stock (SS), 148, 150, 152, 153, 155, 157–166
 - frequency and cumulative distribution
 - average weekly demand, 148
 - and carrying costs, 150
 - cost of maintaining, 152
 - cumulative probability, 148
 - maximum demand for eggs, 150
 - on X-axis and Y-axis, 152
 - probability distribution, 150
 - procurement lead time, 152
 - variable lead time, 150
 - weekly demand for eggs,
 - at Rosetta's, 148
 - Statistical distribution
 - demand period and lead time, 157–162
 - GOAL SEEK function, in MS
 - Excel, 161
 - lead time demand, 153
 - planned shortages/backlogging, 165, 166
 - reorder level, 155
 - variable demand and lead time, 164, 165
 - variable lead time and constant demand, 163, 164
- Same order frequency, 200
- Selective inventory control
 - ABC \times VED technique, 223
 - ABC classification, 212, 215, 216
 - exchange curves, 217–219
 - FSN classification, 221
 - techniques, 211
 - VED classification, 219–222

Service level

- calculation, 147
- cycle, 147
- description, 146
- fill rate, 147
- types, 147
- Shortage cost, 23
- Silver-meal heuristic
 - beginning of February, 108
 - beginning of January, 106
 - beginning of June, 114
 - beginning of March, 109
 - beginning of May, 113
 - demand for February, 108
 - demand for January, 106
 - demand for June, 114
 - demand for March, 110
 - demand for May, 112
 - February-March order horizon, 109
 - January-February order horizon, 107
 - lot-sizing problem, 115
 - March-April-May order horizon, 111, 112
 - optimal order quantity, 105
 - PPC, 107
 - total inventory cost, 115
 - total inventory costs per period, 104, 105
- Single period inventory model, 236–242
 - assumptions, 236
 - costs
 - cost of underage and overage, 238
 - critical ratio, 237
 - expected value of this cost, 237
 - resupply, cost of, 238
 - underage and overage, cost of, 236
 - discrete distribution, 245, 246
 - normally distributed demand
 - critical ratio, 241
 - H&N, 241
 - mean and standard deviation, 239, 240
 - normal distribution, 241
 - salvage value, 242
 - tortilla, weekly demand for, 239
 - Poisson distributed demand, 243, 244
 - underestimating and overestimating
 - cancellation, cost of, 249
 - uniformly distributed demand, 242, 243
- Single Price-Break Model, 63–66
- Slow-moving items, 252
- Slow-moving spares, 259
- Soccer, 248
- Space constraint, 182, 187–192
- Special items, 255
- Sports gear, 248

- Stochastic inventory model, 146, 147, 166
 classification, 146
 continuous review-based inventory system, 146
 cumulative probability plot, 174
 periodic review-based models (*see* Periodic review models)
 safety stock (*see* Safety stock (SS))
 service levels (*see* Service level)
- Style goods, 233, 236, 238, 248
- Sun Corporation, 42, 43
- T**
- Tequila production process, 9–10
- Thermal Power Plant, 264–265
- Time-Varying Demand, 26–27
- Tortilla-making machines, 29
- Tortillas, 24, 28
- Total annual inventory cost (TIC), 36
- Total inventory cost, 76, 193, 202
- Total inventory cost function, 37
- Two-stage inventory system
 deterministic demand, 269–274
 notations, 269
 probabilistic demand, 274
 stages, 268
 system, 269
- U**
- Underage cost, 237, 243, 250
- V**
- Variable demand, 155–157, 164, 165, 167, 171, 172
 in order quantity
 and constant lead time, 167
 and lead time, 171, 172
 in reorder level
 and constant lead time, 155–157
 and lead time, 164, 165
- Variable lead time
 in order quantity, 170
 in reorder level, 163
- VED classification
 categorization criteria, 220
 criticality, item, 220
 desirable item, 219, 220
 essential item, 219
 risk factors, 220
 sample of items, 221
 vital item, 219, 220
- W**
- Wagner-Whitin lot-sizing method
 beginning of January, 127
 beginning of March, 130
 cost parameters, 127
 demand for April, 131
 demand for February, 128
 demand for February and March, 130
 demand for June, 135
 demand for March, 129
 demand for May, 134, 135
 inventory costs for Iteration, 131
 January demand, 128
 March demand, 131
 principles, 127
 total inventory costs, 129