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**DETERMINISTIC EPQ MODEL WITH TIME - VARYING PRODUCTION RATE,
DEMAND RATE, AND HOLDING COST UNDER THE CONDITION OF
PERMISSIBLE DELAY IN PAYMENTS**

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Abstract

In this study we have done a work on an EPQ inventory model with time-varying demand rate, demand dependent production rate, variable holding cost and permissible delay in payments. In this work we have taken the demand as a linear function of time and production is the function of demand i.e. production is also function of time. Here we discussed two cases one with constant holding cost and one with time-dependent holding cost separately. All the work done in the environment of permissible delay in payments, taking into consideration the small rate of the deterioration of the items and got optimal cycle time and the minimum total system cost under the condition of permissible delay is relaxed to that at the end of the credit period, the retailer will make a partial payment on total purchasing cost to the supplier and pay off the remaining balance by loan from the bank. Numerical examples are taken to illustrate the procedure of finding the optimal total inventory cost and production cycle time. Sensitivity analysis is carried out to demonstrate the effects of changing parameter values on the optimal solution of the system.

Keywords: EPQ Model, Deteriorating item, variable demand rates, permissible delay in payment, variable production rate, variable holding cost.

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