THE ISSUE OF OPTIMAL USE OF ENTERPRISE TOOLS

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Annotation. In this work if the processing time for each detail on each machine is clear, the working time fund of the machines, and the profit from the finished products are determined, the goal of solving the problem is to find the optimal work plan of the tools.

Key words: Industrial enterprises, product, maximum, optimal plan, tools.

ВОПРОС ОПТИМАЛЬНОГО ИСПОЛЬЗОВАНИЯ ИНСТРУМЕНТОВ ПРЕДПРИЯТИЯ

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Аннотация. В данной работе, если понятно время обработки каждой детали на каждом станке, определен фонд рабочего времени станков, прибыль от готовой продукции, то целью решения задачи является поиск оптимального плана работы инструментов.

Ключевые слова: Промышленные предприятия, продукция, максимум, оптимальный план, орудия труда.

Industrial enterprises have several tools and equipment. them It can be divided into 2 types.

1). If only one operation can be performed on instruments, they are said to be non-interchangeable instruments.

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2). If several types of operations are performed on tools, they are called interchangeable tools.

In the first type of tools, the detail is processed sequentially. If the processing time for each detail on each machine tool, the working time fund of the machines, and the profit from the finished products are determined, the goal of solving the problem is to find the optimal work plan of the tools. In other words, what type of part and how much should be produced in order to maximize the profit from them.

Enter the following characters.

j – types of products;

C_j – j profit from a retail unit;

a_{ji} – i the cost of time spent processing from a type of tool to a type of product unit; j

A_j – i type tool working time fund;

X_j – the number of types of products produced in the optimal plan . j

Economic-mathematical model.

$$F = \sum C_{jj} * X_j = \mathrm{m}ax$$

The profit from the products should be the maximum.

1) j - i the condition that the time spent on the production of the product on the tool does not exceed the percentage of the working time of the tool

$$\sum a_{ij} * xj < A_i$$

2) $X_j > 0$

The model seen above does not fully determine the optimal option for the use of production capacity in the enterprise. Therefore, the production program in several options, for example, taking into account the implementation of the annual plan of the enterprise, without changing the structure of the plan, maximum

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product production, production according to its full range of products, full use of equipment, taking into account such things as the implementation of the maximum profit program, the enterprise will use its production capacity wisely.

In industrial enterprises, sometimes machines, automatic lines, or a certain group of tools may be involved in the production of products. For example, in the production of a part, several interchangeable machines are used. The labor productivity of these equipments, the time it takes to produce the product, and the cost may be different. Therefore, at this time, it is necessary to mathematically express the problem of distribution of production with optimal use of equipment.

Economic setting of the issue. There are several different tools. Each type of tool can produce several types of products. That is, the time fund for each type of tool is known. The production cost of each detail is also clear.

It is necessary to divide the parts for processing in the means of production in such a way that the amount of total expenses is minimal. Let's formalize the issue.

j - detail type number;

$A_i - i$ working time fund of type tool;

$L_{ij} - j$ norm of time cost of processing a type of detail in a tool of the number per unit ; i

$B_j - j$ type detail processing plan;

$C_{ij} - i$ costs for the production of one type of product in a type of tool ; j

$X_{ij} - i$ which produces from the type tool j .

Economic-mathematical model.

Objective: Minimize total machining costs

$$F = \sum \sum C_{ij} * X_{ij} \to \min$$

1) When processing details, i the time cost of the type of tool should not exceed the working time fund of this tool

$$\sum L_{ij} * X_{ij} \leq A_i$$

2) The number of parts processed in all types of tools should be equal to the production plan

$$\sum X_{ij} = B_j$$

3) $X_{ij} > 0.$

Summary. By creating an economic-mathematical model of the given problem, the total cost of processing i the details, provided that the time cost of the type of tool when processing the details does not exceed the working time fund of this tool, and the number of details processed in all types of tools is equal to the production plan . it will be possible to determine the minimum amount of.

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