MAHATMA GANDHI MISSION'S

COLLEGE OF ENGINEERING & TECHNOLOGY

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DEPARTMENT OF CSE,ME,CE,ECE

Subject- Industrial Management **Subject code –RAS-601** **Question Bank No.3**

TOPICS -UNIT 3

Q1. Each question contain 2 marks .For assignment attempt any Five.

(a) Define Ergonomics.

Ans=Ergonomics (from the Greek word ergon meaning work), is the science of refining the design of products to optimize them for human use. Human characteristics, such as height, weight, and proportions are considered, as well as information about human hearing, sight, temperature preferences, and so on. Ergonomics is sometimes known as human factors engineering.

(b) Differentiate between time and motion study?

Ans=(1) Motion Study involves the study of motions on an operation while the time study notes the time involved in carrying out each element of operation.

(2) The main aim of Motion Study is to reduce wastage of time and materials scraping the unnecessary movements whereas the time study aims at fixing the standard time for carrying out a job.

(3) Time study is not suitable for workers where quality is prime consideration. Motion study is suitable for all types of jobs.

(c) Define Flowchart.

Ans=A flowchart is a picture of the separate steps of a process in sequential order. It is a generic tool that can be adapted for a wide variety of purposes, and can be used to describe various processes, such as a manufacturing process, an administrative or service process, or a project plan.

(d) What is Cyclograph?

Ans=A cyclograph is a record off path of movements usually traced by a continuous source of light on a photograph. A small electric bulb is attached to hand, finger or other part of the body of the operator performing the operation.

(e) What is Chronocyclograph?

Ans=The Chronocyclograph is special form of cycle graph in which the light source is suitably interrupted so that the path appears as a series of pear-shaped dots the pointed end indicating the direction of movement and the spacing indicating the speed of movement.

(f) Give two examples of different inventories.

Ans=examples of different inventories are:-

1. aluminum and steel for the manufacture of cars

2.a half-assembled airliner

(g) What is Micromotion study?

Ans=Micromotion study is the technique in time and motion study of making a pictorial elapsed-time study of the elements or subdivisions of an operation by means of a high-speed motion-picture camera and a specialized timing device.

(h) What is Inventory?

Ans=Inventory is the term for the goods available for sale and raw materials used to produce goods available for sale. Inventory represents one of the most important assets of a business

(i) What is inventory control?

Ans=Inventory control is the processes employed to maximize a company's use of inventory. The goal of inventory control is to generate the maximum profit from the least amount of inventory investment without intruding upon customer satisfaction levels.

(j) What is Simo chart?

Ans=SIMO chart is the graph of the simultaneous movement cycle. It is one of Gilbreth's micro motion study and it provides the separable measures of each relevant operator's limb under research graphically.

Q2. Each question contain 5 marks .For assignment attempt any Five.

a) What are the different types of Inventories? Explain them.

Ans=The different types of Inventories are:

1.Raw Materials

Raw materials are the basic materials that a manufacturing company buys from its suppliers and that is used by the former to convert them into the final products by applying a set of manufacturing processes. For example, aluminum scrap is the raw material for a company that produces aluminum ingots. Flour is the raw material for a company that produces bread or pizza. Similarly, metal parts and ingots are the raw materials bought by a company that manufactures cars and crude oil is the raw material for an oil refinery.

2.Work in Progress (WIP) Inventory

Work in progress inventory can also be called semi-finished goods. They are the raw materials that have been taken out of the raw materials store and are now undergoing the process of their conversion into the final products. These are the partly processed raw materials lying on the production floor. And they have also not reached the stage where they have been converted into the final product.

3.Finished Goods Inventory:

Finished goods are indeed the final products obtained after the application of the manufacturing processes on the raw materials and the semi-finished goods discussed above in the article. They are saleable and their sale contributes fully to the revenue from the core operations of the company.

Regarding the level of finished goods inventory, there are two types of industries that we need to look at. First, we would take the industries in which the finished goods are mass-produced and the sale happens after the production. Examples of such industries are the FMCG industry and the oil industry.

b) What are the objectives and techniques of Motion study?

Ans=Motion study implies dividing the work into fundamental elements or basic operations of a job or a process with the object of eliminating unnecessary or defective elements in a job. After investigating all movements in a job, process or operation it finds out the most scientific and systematic method of performing the operation or completing the job.

Objectives of time and motion study are:

1. They eliminate unnecessary motions, fatigue, and seek to improve human efforts in doing a job.

2. They bring about improvement in method, procedure, techniques and processes relating to a job.

3. They make effective utilisation of materials, machines, human resources.

4. They also improve layout and design of plant and equipment and working environment.

c) Discuss the significance of Inventory control in managing any industrial Organization.

Ans=Inventory control is essentially about reducing costs and improving service. It is also how you manage your working capital to maintain consistent and adequate cash flow.

Inventory management enhances business operations with the effective flow of goods and services. Inventory Management and control implies the controlling of business stock or controlling the movement of products and services following their demand. Inventory Management and control are highly beneficial in today's business world as it makes a vital part in any business success/failure having intense competition within its industry. The benefits of inventory management and the knowledge about its usage are vital for enhancing product quality, improving competitive ability, reducing inventory carrying costs by reducing inventories, service enhancement, and operational flexibility through pull systems. Inventory Management and control provide actions & strategies that are integrated into all management controlling, planning, and processes which are crucial to enhancing and making successful management.

d) What is Therblig? Explain.

Ans=Therbligs primarily refer to motion of human body at the workplace and to the mental activities associated with it. They permit much more precise and detailed description of the work than any other recording techniques.

Therbligs were suggested by Frank B. Gilberth the founder of motion study who differentiated 17 fundamental hand or hand and eye motions to which an eighteenth has been added.

Each therblig has a specific color, symbol and letter for recording purposes.

Therbligs are used for the following:

1.In studying the activities of two or more persons on a group work.

2.In studying the relationship of the activities of the operator and the machine as a means of timing operations.

3.In obtaining motion time data for time standards.

4.Acts as a permanent record of the method and time of activities of the operator and the machine.

e) What is the role of Time study in Production?

ans=Time study may be defined as "the art of observing and recording the time required to do each detailed element of an industrial operation".

(i) It is useful in determining the standard time for various operations, which helps in fixing wages and incentives.

(ii) It is useful to estimate the cost of a product accurately.

(iii) It helps in production control.

(iv) It helps in predicting accurately as to when the work will be completed and hence customers can be promised to take delivery on a fixed date.

(v) Using the time study techniques, it can be found that how much machines an opera-tor can run.

f) What is the importance and objectives of method study?

Ans=The objective of method study is to simplify the job and develop more economical methods of doing it. Method study is systematic both in investigation of problem being considered and in the development of its solutions. It can be stated as one of most penetrating tools of investigation available to management.

Important objectives of method study are:

(1) The improvement of processes and procedures.

(2) Factory and work place layout improvement.

(3) Improvement in the design of plant and equipment.

(4) Reduction in unnecessary fatigue and movements.

(5) Use of improved materials, machines and manpower.

(6) Better Working conditions.

g) What is Economic Order Quantity? Explain

Ans=Economic order quantity (EOQ) is the order size that minimizes the sum of ordering and holding costs related to raw materials or merchandise inventories. In other words, it is the optimal inventory size that should be ordered with the supplier to minimize the total annual inventory cost of the business.

The economic order quantity is computed by both manufacturing companies and merchandising companies. Manufacturing companies compute it to find the optimal order

size of raw materials inventory and merchandising companies compute it to find the optimal order size of ready to use merchandise inventory.

The two significant factors that are considered while determining the economic order quantity (EOQ) for any business are the ordering costs and the holding costs.

1.Ordering Costs

The ordering costs are the costs that are incurred every time an order for inventory is placed with the supplier. Examples of these costs include telephone charges, delivery charges, invoice verification expenses and payment processing expenses etc.

2.Holding Costs

The holding costs (also known as carrying costs) are the costs that are incurred to hold the inventory in a store or warehouse. Examples of costs associated with holding of inventory include occupancy of storage space, rent, shrinkage, deterioration, obsolescence, insurance and property tax etc.

The following formula is used to determine the economic order quantity (EOQ):

EOQ=squareroot((2*D*Co)/Ch)

Where,

D = Demand per year,Co = Cost per order,Ch = Cost of holding per unit of inventory

p) Differentiate between Fixed Order Quantity System and Fixed Order Period System.

h) Explain the common inventory management techniques.

Ans=Some inventory Technique are listed below:-

1.Economic Order Quantity

Economic order quantity is the lowest amount of inventory you must order to meet peak customer demand without going out of stock and without producing obsolete inventory.

Economic order quantity uses three variables: demand, relevant ordering cost, and relevant carrying cost. Use them to set up an EOQ formula:

Demand: The demand, in units, for the product for a specific time period.

Relevant ordering cost: Ordering cost per purchase order.

Relevant carrying cost: Carrying costs for one unit. Assume the unit is in stock for the time period used for demand.

2.Minimum Order Quantity

Minimum order quantity (MOQ) is the lowest set amount of stock that a supplier is willing to sell. If you can’t purchase the MOQ of a specific product, then the supplier won’t sell it to you.

The purpose of minimum order quantities is to allow suppliers to increase their profits while getting rid of more inventory more quickly and weeding out the “bargain shoppers” simultaneously.

3.ABC Analysis

ABC analysis of inventory is a method of sorting your inventory into 3 categories according to how well they sell and how much they cost to hold:

A-Items – Best-selling items that don’t take up all your warehouse space or cost

B-Items – Mid-range items that sell regularly but may cost more than A-items to hold

C-Items – The rest of your inventory that makes up the bulk of your inventory costs while contributing the least to your bottom line

4.Just In Time Inventory Management

Just-in-Time Inventory Management is simply making what is needed, when it’s needed, in the

amount needed.

Many companies operate on a “just-in-case” basis – holding a small amount of stock in case of an unexpected peak in demand.

JIT attempts to establish a “zero inventory” system by manufacturing goods to order; it operates on a “pull” system whereby an order comes through and initiates a cascade response throughout the entire supply chain – signaling to the staff they need to order inventory or begin producing the required item.

5.Safety Stock Inventory

Safety stock inventory is a small, surplus amount of inventory you keep on hand to guard against variability in market demand and lead times.

Safety stock plays an integral role in the smooth operations of your supply chain in various ways.

Here are just a few:

*Protection against unexpected spikes in demand

*Prevention of stockouts

*Compensation for inaccurate market forecasts

*And a buffer for longer-than-expected lead times

6.FIFO and LIFO

FIFO and LIFO are accounting methods used to value your inventory and report your profitability.

FIFO (first in, first out) is an inventory accounting method that says the first items in your inventory are the first ones that leave – meaning you get rid of your oldest inventory first.

LIFO (last in, first out) is an inventory accounting method that says the last items in your inventory are the first ones that leave – meaning you get rid of the newest inventory first.

7.Reorder Point Formula

A reorder point formula tells you approximately when you should order more stock – that is, when you’ve reached the lowest amount of inventory you can sustain before you need more.

Here’s the reorder point formula you can use today:

(Average Daily Unit Sales x Average Lead Time in Days) + Safety Stock = Reorder Point

8.Batch Tracking

Batch tracking is sometimes referred to as lot tracking, and it’s a process for efficiently tracing goods along the distribution chain using batch numbers.

From raw materials to finished goods, batch tracking allows you to see where your goods came from, where they went, how much was shipped, and when they expire if they have an expiration date.

Q3. Each question contain 10 marks .For assignment attempt any Two.

a) Explain Continuous and Periodic Inventory control system.

Ans=The periodic inventory system is a method of inventory valuation for financial reporting purposes in which a physical count of the inventory is performed at specific intervals. This accounting method takes inventory at the beginning of a period, adds new inventory purchases during the period and deducts ending inventory to derive the cost of goods sold (COGS).

Advantages of Periodic Inventory System

1.Since no permanent employee is required for physical counting of merchandise inventory under this system it is less expensive.

2.It is applicable for all business organizations large or small dealing with specific or a variety of goods.

3.Since stock taking is done at the end of a period under this system the normal activities of the business are not hampered.

4.Since the stock-taking of merchandise is done on a particular date the quantity of stock of merchandise is reliable.

Disadvantages of Periodic Inventory System

1.On the very day of the physical counting of merchandise stock, normal activities of business remain almost suspended.

2.The act of counting merchandise stock is to be completed hurriedly due to a shortage of time.

3.Under this system chance of fraud and forgery lies, because here continuous control over merchandise is absent.

4.Under this system, the stock control device is very weak. Their employees get a chance to adopt corruption.

A perpetual inventory system, or continuous inventory system, is an inventory control system that allows businesses to keep a real-time account of inventory on hand. The widespread use of computers after the 1970s increased this systems popularity because businesses were able to more easily keep track of inventory as it sold. Barcodes, radiofrequency identification scanners (known as RFID), and point of sale systems (also known as POS) provided support for this system by quickly inputting inventory information as customers purchase items.

A continuous inventory system are common in many modern businesses. They are most often found in large businesses, businesses with multiple locations, or businesses that carry expensive products, such as a jeweler or electronics store. While errors in inventory occur due to loss, breakage, theft, improper inventory tracking, or scanning errors, there are many advantages to using a perpetual inventory system:

1.Prevents stock outs; a stock out means that a product is out of stock

2.Gives business owners a more accurate understanding of customer preferences

3.Allows business owners to centralize the inventory management system for multiple locations

4.Provides greater accuracy due to each inventory item being recorded on a separate ledger

5.Gives valuable information to business owners, such as discounts, purchases, and returns

6.Reduces physical inventory counts

b) Explain the concept ABC –VED Analysis in inventory control.

Ans=ABC analysis is a system for inventory control used throughout materials and distribution management. It is also sometimes referred to as selective inventory control, or SIC. ABC analysis can be put to use for a wide range of inventory items, such as manufactured products, components, spare parts, finished goods, unfinished goods or sub assemblies.

Whatever sort of items on an inventory it is used for, the approach works by setting all of them into three distinct categories. Therefore, ABC analysis is a system of categorization, using three classes, of which each class has a differing management control.

The Three Classes Used in ABC Analysis

The ‘ABC’ in ABC analysis, as known as ABC Classification, refers to the three classes or categories used in the system. The first, A, is the category for items that are outstandingly important, or business critical. The second, B, is the classification for items of average or middling importance. Finally, category C is the designation for relatively unimportant

items. As a basis for a control scheme, each class ought to be handled in a different way. As you might have guessed, more attention will usually be devoted to category A items, with less to B and still less further to C.

Many people are familiar with the so-called ’80/20 rule’, also known as the Pareto Analysis, which can be put to use with the ABC analysis for inventory management. Under this rule, in terms of consumption, 80 percent of the value of inventory would be held in about 20 per cent of the items. By using this principle, categories B and C would make up the remaining 80 per cent of the items, perhaps B with 30 per cent and C with 50 percent.

However, in terms of their consumption value B and C would make up on 20 per cent of the value combined, with C the least, perhaps split at 15 per cent and 5 per cent respectively. The percentages will vary based on a distributor’s unique inventory control needs.

This means that ABC analysis conforms with the Pareto principle which states that items that account for a large proportion of the overall value are small in number and that items with a low overall value are high in number. It is also worth remembering that the proportions of the ABC values, both in terms of their consumption value and their number of items, are not set in stone, so long as they add up to 100 percent.

VED stands for vital, essential and desirable. This analysis relates to the classifica-tion of maintenance spare parts and denotes the essentiality of stocking spares.

The spares are split into three categories in order of importance. From the view-points of functional utility, the effects of non-availability at the time of requirement or the operation, process, production, plant or equipment and the urgency of replacement in case of breakdown.

On the other hand some spares are non-functional, serving relatively unimportant purposes and their replacement can be postponed or alternative methods of repair found. All these factors will have direct effects on the stocks of spares to be maintained.

Therefore, it is necessary to classify the spares in the following categories:

V:

Vital items which render the equipment or the whole line operation in a process totally and immediately inoperative or unsafe; and if these items go out of stock or are not readily available, there is loss of production for the whole period.

E:

Essential items which reduce the equipment’s performance but do not render it inoperative or unsafe; non-availability of these items may result in temporary loss of production or dislocation of production work; replacement can be delayed without affecting the equipment’s performance seriously; temporary repairs are sometimes possible.

D:

Desirable items which are mostly non-functional and do not affect the performance of the equipment.

However, the decision regarding the stock of spares to be maintained will depend not only on how critical the spares are from the functional point of view (VED analysis) but also on the annual con-sumption (user) cost of spares (ABC — analysis) and, therefore, for control of spare parts both VED and ABC analyses are to be combined.

c) The annual demand of an item is 3200 units. The unit cost is Rs. 6/- and inventory carrying charges 25% per annum. If the cost of one procurement is Rs.150.Determine

1) EOQ

2) No. of orders per year

3) Optimal Cost

Ans=1)eoq=sqrt[{2(annunal demand)(order cost)}/{annual carrying cost per unit}]
=sqrt[{2(3200)(150)}/{25%*3200*6/3200}]
=sqrt[{(3200)(300)}/{4800/3200}]
=sqrt[{(3200)(300)}/{1.5}]
=sqrt[{960000}/{1.5}]
=sqrt[640000]
=800

2) no of orders at eoq units =3200/800=4 orders

3) optimal cost=
3200*6=19200
150*4=600
25%*3200*6=4800
total =24600

so optimal cost =58350