WORK STUDY & ERGONOMICS (IPPX-303)

Department of Industrial and Production Engineering

Dr. B R Ambedkar National Institute of Technology,
Jalandhar, Punjab

Submitted by:
Priyanshu Raj
Roll no. 21113066
IPE (5th Sem.)

Submitted to:
Sheetal Soda
(assistant professor)

WSE Tutorial Sheet-I

Q.1- Describe the concept of Work Study and Ergonomics.

Q.2- Explain principles of lean philosophy.

Q.3- Identify any one product of your choice and list its different components.

Q.4- List the various activities for its manufacturing.

Q.5- Categorize the above activities based on lean philosophy.

Q.1- Describe the concept of Work Study and Ergonomics.

Ans: Work study: Work study in industries involves observing, analyzing, and improving work processes to optimize productivity. Industrial engineers and analysts use work study techniques to study how tasks are performed, find bottlenecks, and different ways to streamline operations for maximum productivity. They may use methods like time and motion studies to break down tasks, analyze work methods, and determine the most efficient ways to complete them.

The work study process typically involves the following steps:

Method Study: This step involves breaking down tasks into their individual components to understand the best way to perform them. It aims to eliminate unnecessary steps and reduce the number of movements required to complete a task.

Time Study: In this step, the time taken to perform each task is measured precisely. This data is then used to set standard times for completing tasks.

Work Measurement: Work measurement combines the results of method study and time study to establish standard times for completing tasks, which can be used for planning and scheduling work.

Ergonomics: Ergonomics focuses on designing workspaces, tools, and equipment to fit the human body's capabilities and limitations in an industrial setup. By considering human factors, companies can reduce injuries, fatigue, and discomfort associated with repetitive tasks.

Q.2- Explain principles of lean philosophy.

Ans:Lean philosophy principles are:

1)Value: Focus on delivering what customers value and are willing to pay for.

2)Value Stream: Analyze and optimize the entire process from start to finish to create smooth and efficient workflows.

3)Flow: Ensure work moves seamlessly and avoid interruptions or delays in the process.

4)Pull: Produce based on actual customer demand to avoid excess inventory and waste.

5)Perfection: Strive for continuous improvement to achieve the highest level of efficiency and quality.

6)Continuous Improvement (Kaizen): Encourage constant small improvements in all aspects of work.

7)Respect for People: Value and empower employees to foster a positive and motivated workforce.

8)Elimination of Waste (Muda): Identify and eliminate any activities that do not add value.

9)Standardization: Establish consistent processes and procedures to maintain efficiency and effectiveness.

10)Visual Management: Use visual tools to enhance communication and decision-making processes.

Q.3- Identify any one product of your choice and list its different components.

Ans: My choice of product is Indian currency notes. Different components of a Indian currency are as follows:

Watermarks

Security Threads

Color-Shifting Ink

Intaglio Print

Optically Variable Ink

Security Threads

Micro-Optics

Raised Print

Indian currency

Q.4- List the various activities for its manufacturing.

Ans: Various activities for the manufacturing of a fountain pen are as follows:

Value-Adding Activities:

Designing the currency notes: Developing unique and aesthetically appealing designs that incorporate security features.

Printing plates preparation: Engraving the designs onto metal plates to create intricate and detailed patterns on the currency notes.

Paper production: Manufacturing special security paper with the required features and durability.

Printing: Applying ink to the engraved plates and transferring the design onto the security paper to create the actual currency notes.

Incorporation of security features: Introducing various security measures like watermarks, security threads, and holograms that deter counterfeiting and enhance the note's security.

Numbering and serializing: Sequentially numbering and providing unique serial codes to each currency note for identification.

Non-value-Adding Activities:

Inspection and quality control: While essential, these activities do not directly contribute to the creation of the currency notes' value. They are necessary to ensure the notes meet quality standards, but they don't add value in the eyes of the customer.

Cutting and separation: Dividing the printed sheets into individual notes and separating them may be necessary but doesn't add value to the notes themselves.

Packing and distribution: While vital for delivering the notes to the banks and financial institutions, these activities are not directly contributing to the notes' intrinsic value.

Q.5- Categorize the above activities based on lean philosophy.

Inspection and quality control: While essential, these activities do not directly contribute to the creation of the currency notes' value. They are necessary to ensure the notes meet quality standards, but they don't add value in the eyes of the customer.

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Various activities involved in manufacturing of Indian currency:

S. No.	Activity	Non-Necessary + Non-Value	Necessary + Non-Value	Necessary + Value Adding
1	Designing		Yes	
2	Design and Engraving	Yes		
3	Plates/Cylinder making	Yes		
4	Design Preparation:		Yes	
5	Master Engraving:	Yes		
6	Transfer to Working Die or Roll	Yes		
7	Tool Preparation		Yes	
8	Electroplating	Yes		
9	Test Printing:	Yes		
10	Final Tool Production		Yes	
11	Printing plates preparation		Yes	
12	Raw Material Preparation for Paper production		Yes	
13	Fiber Treatment		Yes	
14	Papermaking Process		Yes	

15	Coating			Yes
16	Calendering			Yes
17	Waste Treatment	Yes		
18	Offset Printing			Yes
19	Digital Printing			Yes
20	Flexographic Printing			Yes
21	Screen Printing			Yes
22	Gravure Printing			Yes
23	Cutting and Trimming			Yes
24	Incorporation of security features			Yes
25	Numbering and serializing	Yes		
26	Inspection and quality control		Yes	
27	Cutting and separation		Yes	
28	Packing and distribution	Yes		