EJERCICIOS TEMA SMED
EQUIPO: _____

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1. Seleccione las razones más communes para hacer “batching” (lotes) (Nota: Seleccione todas las que apliquen)

A. Fixed machine capacity (capacidad fija de la máquina)
B. Setups required (Setups requeridos)
C. Variable machine capacity (capacidad variable de la máquina)
D. Raw material is batched (Materia prima en lotes)
E. Final products are batched (Producto final en lotes)

2. Batch Size and Its Effect

En el ejemplo del “propeller”: Se produce un flujo de 2 unidades. Ambas partes son procesdas en la misma máquina. En un caso con tiempo de *setup* entre las partes, ¿cómo debería afectar un cambio en el tamaño del lote la producción del producto?

A. A mayor tamaño de lote, menor capacidad.
B. A mayor tamaño de lote, mayor capacidad.
C. A menor tamaño de lote, se requieren menos recursos.
D. El tamaño de lote no tiene influencia en la capacidad.

3. En el siguiente ejemplo: Para producir un libro que consiste de dos partes: La cubierta y las páginas. Ambas partes se imprimen en la misma máquina. ¿Bajo qué circunstancias seleccionarías un lote pequeño?

A. Si un libro tiene que ser entregado tan pronto como sea posible.
B. Si quieres producir una gran cantidad de libros idénticos tan pronto como sea posible.
C. Siempre se debe seleccionar un tamaño grande de lote.

We are looking at the following simple skateboard production:

A skateboard consists of 3 parts: The deck, the four wheels, and the two trucks.
The production times are:

- Deck: 4 mins
- Wheels: 3 mins
- Trucks: 5 mins
- Total production time for one skateboard: = 4 + 3 + 5 = 12 min

Please answer the questions below.

Skateboard Example Without Setups - Questions

These are questions belonging to the skateboard example introduced above.
We assume there is unlimited input and unlimited demand (--> Flow Rate = Process Capacity =

Capacity of the bottleneck)
Remember the formula for capacity without setups:
Resource Capacity = (1/p)

4. Please calculate the capacity in units per hour for this process for batch size B = 3. Round your final result to two decimal places.

(Hint: look for the bottleneck!)

A. 5.00 units/hour
B. 6.00 units/hour
C. 12.00 units/hour
D. 10.00 units/hour

5. Please calculate the capacity in units per hour for batch size B = 10. Round your results to two decimal places.

A. 5.00 units/hour
B. 6.00 units/hour
C. 12.00 units/hour
D. 10.00 units/hour

6. If the capacity is the same for both examples. Why is this?

A. It is not the same.
B. Without setups, the batch size has no effect on the capacity.
C. It is the same only by coincidence.

<u>We are looking at the following simple skateboard production:</u>
A skateboard consists of 3 parts: The deck, the four wheels, and the two axes.
There is a setup needed for the deck every time a different model is produced.
The production times are:

- Deck: p = 4 mins
- Wheels: p = 3 mins
- Trucks: p = 5 mins
- Total production time for one skateboard: 4 + 3 + 5 = 12 mins

The setup times at the Deck step for a new model is

- Setup Time for Deck: 2 min

Please answer the questions below.

Skateboard Example With Setups - Questions

These are questions belonging to the skateboard example introduced above.

7. Looking at each step in isolation, which step in the skateboard process will be affected by batching skateboard models?

A. Deck
B. Wheels

C. Trucks
D. None will be affected.

8. Will the capacity at this step go up or down as the batch size is increased?
A. The capacity will go up
B. The capacity will go down
C. The capacity will remain the same

Skateboard Example With Setups - Finding the Bottleneck

These are questions belonging to the skateboard example introduced above.
Remember the formula for capacity with setups:

$$\text{Capacity with Setups} = \frac{\text{Flow Units Produced}}{\text{Setup Time} + \text{Production Time}} = \frac{\text{Batch Size}}{\text{Setup Time} + \text{Batch Size} \times \text{Time per Flow Unit}}$$

9. Please calculate the capacity at the Deck step in units per hour for batch size B = 1.
A. 10.0
B. 12.0
C. 12.9
D. 15.00

10. For B = 1, where is the bottleneck?
A. Deck
B. Wheels
C. Trucks

Skateboard Example With Setups - Finding the Bottleneck B=5

These are questions belonging to the skateboard example introduced above.
Remember the formula for capacity with setups:

$$\text{Capacity with Setups} = \frac{\text{Flow Units Produced}}{\text{Setup Time} + \text{Production Time}} = \frac{\text{Batch Size}}{\text{Setup Time} + \text{Batch Size} \times \text{Time per Flow Unit}}$$

11. Please calculate the capacity in units per hour for batch size B = 5 at the Deck step.
A. 10.0
B. 12.9
C. 13.3
D. 13.6
E. 15.00

12. For B = 5, where is the bottleneck?

A. Deck
B. Wheels
C. Trucks

Optimal Batch Size

13. What would you choose as optimal batch size so that the Deck capacity equals the capacity of Trucks (12 units/hour)?

$$\text{Capacity with Setups} = \frac{\text{Flow Units Produced}}{\text{Setup Time} + \text{Production Time}} = \frac{\text{Batch Size}}{\text{Setup Time} + \text{Batch Size} \times \text{Time per Flow Unit}}$$

A. B = 1
B. B = 2
C. B = 5
D. B = 100

Total Product Maintenance

1. According to the lecture, Total Product Maintenance (TPM) is an organization-wide effort to reduce losses on account of equipment failure, slower speed and defectives. The objectives of TPM include all of the following EXCEPT

A. Equipment reliability
B. Avoiding unplanned machine downtime
C. Optimize costs of quality related to machines
D. Reduced equipment life-span
E. Maximum equipment efficiency

2. Metrics of Overall Equipment Effectiveness

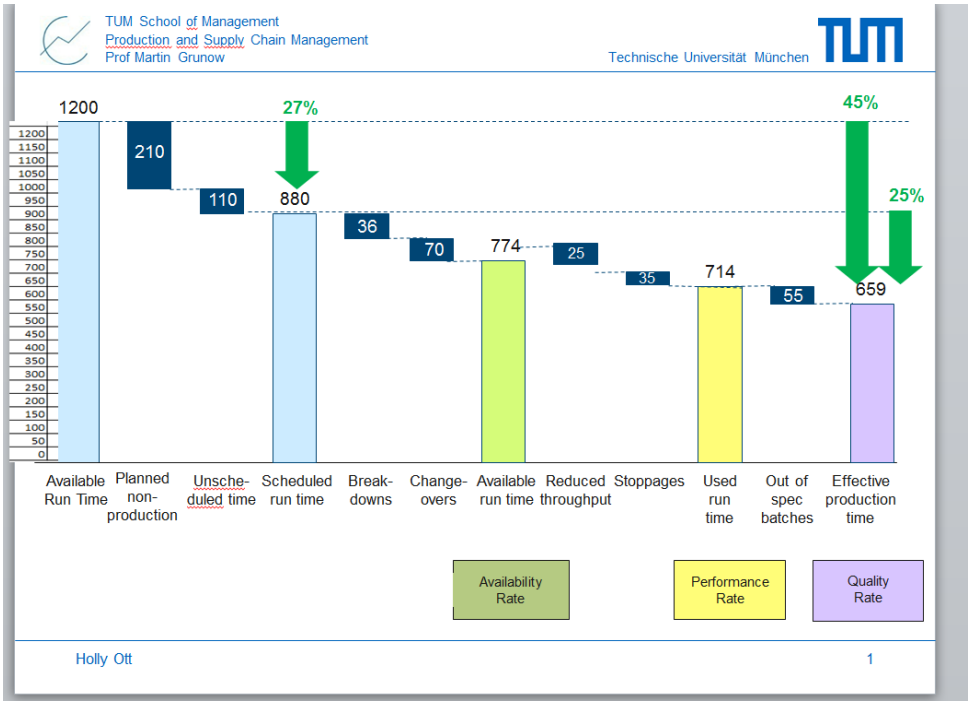
In Overall Equipment Effectiveness, it is necessary to Implement standard procedures to secure constant quality of processes and checks at the right positions within process to eliminate need for rework. This is done in order to improve_____

A. Performance
B. Quality
C. Availability

3. Improving Availability Rate

In Overall Equipment Effectiveness, improving the Availability Rate is important in order to reduce the breakdown or machine failure and changeover time. All these are important steps to take in achieving this EXCEPT

A. Employ SMED to shorten setup time.
B. Letting operators undertake own simple maintenance tasks.
C. Conducting planned maintenance, both preventive and predictive maintenance.
D. Conduct root-cause problem solving to determine whether problem is due to staff, material, method, or machine.



4. OEE Calculation

Using the information from the chart above, Please calculate the Availability Rate,to two decimal places.

A. 0.77
B. 0.67
C. 0.88
D. 0.95

5. Using the information from the chart above, Please calculate the Performance Rate, to two decimal places.

A. 0.87
B. 0.92
C. 0.84
D. 0.63

6. Using the information from the chart above, Please calculate the Quality Rate, approximately to two decimal places.

A. 0.92
B. 0.77
C. 0.54
D. 0.80