higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PRODUCTION AND QUALITY CONTROL N5

3 August 2021

This marking guideline consists of 5 pages.

Copyright reserved

QUESTION 1

1.1 True
1.2 True
1.3 False
1.4 False
1.5 True
1.6 False
1.7 False
1.8 True
1.9 True
1.10 True

(10 × 2) **[20]**

QUESTION 2

2.1 Takt time = $\frac{\text{Time available}}{\text{Required production}}$ ✓✓✓ (3)

2.2
- Production at the rate of customer demand:
  The closest practical approximation of the principle of making only what customers require and only when they require it is to directly link goods scheduled for production to the rate of demand. This is achieved by levelling the production schedule and making use of pull production control.
- Process-based shop floor layout:
  Traditional factories are laid out as departments in which similar activities are performed together. Just-in-Time operations group activities necessary for products with similar production requirements together in a process-based layout, where teams work in manufacturing cells using equipment dedicated to the production of those products only.
- Reduction of work in progress (WIP):
  To facilitate fast, even flow of WIP through the production process, smaller batches of WIP are used. This necessitates more changeovers between batches, so particular emphasis is placed on the reduction of setup and changeover times.
- Quality at source:
  Having less WIP in the process reduces the buffer stock available in the event of production disruptions. Therefore, Just-in-Time production cannot afford to pass on defects down the line, and doing work 'right first time' becomes essential at each workstation. In-line quality checks and process improvement are done by shop floor employees, and they are also given the authority to stop the production line when a problem cannot be fixed quickly.

(4 × 3) (12)

2.3

	WEEK 1	WEEK 2	WEEK 3	WEEK 4
Standard hours required	102	95	92	90
Available hours	96	96	96	88
Daily excess (deficit) in hours	2.3.1 6✓	2.3.2 1✓	2.3.3 4✓	2.3.4 2✓
Cumulative excess (deficit) in hours	2.3.5 6✓	2.3.6 5✓	2.3.7 1✓	2.3.8 3✓

No, the centre is not balanced,✓ since the load exceeds the available capacity.✓ (10)
[25]

QUESTION 3

3.1
- Setup time
- Move time
- Queue time
- Run time
- Wait time (Any 4 × 1) (4)

3.2
- Manufacturing lead times.✓ If targets are not met, inventory levels can rise and delivery dates may be missed.✓
- Customer service.✓ If customer service targets are not met, customers may look for alternative suppliers and leave.✓
- Work-in-progress levels.✓ If WIP levels are higher than the targets set, bottlenecks may result, leading to a reduction in customer service.✓
- Schedule performance.✓ Slippage may cause delivery dates to be missed.✓
- Product quality.✓ If specifications are not met, the cost of poor quality will rise and sub-standard products may reach the customer.✓
- Efficiency of work centres.✓ Inefficiency will result in an increase in WIP and longer lead times.✓
- Reprocessing and scrap. If these are too high, cost rise and bottlenecks may be caused as a result of the processing of products. (Any 6 × 2)

(12)

3.3 Under a make-to-order policy, products are only manufactured when specifically ordered by customers.✓ No stock of finished goods is carried/kept.✓

Advantage: The cost of carrying inventory is reduced.✓
Disadvantage: The customer needs to wait for his/her product.✓ (4)
[20]

QUESTION 4

4.1
- Improved customer service
- Improved inventory management
- Improved distribution
- Reduction in inventories
- Reduction in obsolete inventories
- Improved financial planning and control
- Improved communication and market information (Any 5 × 1) (5)

4.2 STEP 1: Identify the factors that will be considered.
Make a list of factors that are most relevant to the decision and where to locate them.

STEP 2: Allocate relative weightings to the factors.
Decide how important each factor is in comparison to the other factors and then allocate a percentage weighting that reflects the factor's importance. Make sure the weightings add up to 100%.

STEP 3: Rate every site on each of the factors.
Investigate the sites and allocate a rating out of 10 for each factor to indicate how suitable the site is on each factor.

STEP 4: Calculate the score for the factors of all the sites.
Multiply the ratings for each factor by the weighting for the factor to calculate the factor scores for each site.

STEP 5: Calculate the overall score for each site.
Add the factor scores for each site to get an overall site score. (5 × 3) (15)
[20]

QUESTION 5

5.1
- Work overtime – capacity response
- Sub-contract some work – capacity response
- Focus on improving output of bottlenecks – capacity response
- Reroute some jobs to other work centres – load response
- Reschedule some orders – load response (5 × 2) (10)

5.2 Takes 5% longer, therefore efficiency is 95%.✓

Rated capacity = Hours per week × Utilisation × Efficiency✓
= 100 × 0.8 × 0.95 hours per week✓✓
= 76 hours per week✓ (5)
[15]

TOTAL: 100

Copyright reserved