higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE

## PRODUCTION AND QUALITY CONTROL N5

**23 November 2022**

**This marking guideline consists of 6 pages.**

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## SECTION A: CAPACITY MANAGEMENT AND CAPACITY CONTROL

## QUESTION 1

1.1 Capacity is the rate of output that can be achieved from the process.✓✓ (2)

1.2
- Design capacity can be defined as the maximum designed capacity of the plant process or machine.✓✓
- Effective capacity is the planned capacity of an operation, process or machine.✓✓
  OR
  Effective capacity is what a factory manager expects to achieve in a normal day's work. (4)

1.3 Utilisation✓ = $\frac{\text{Actual capacity}}{\text{Design capacity}}$✓✓ (3)

1.4 (a) Raw materials
(b) Consumables
(c) Packaging
(d) Direct labour expenses
(Or any other relevant example) (4)

1.5 $O = \frac{FC}{P - VC}$✓✓

$= \frac{14\ 000}{30 - 10}$✓

$= 700$ units✓ (4)

1.6 a) It determines the flexibility of the MPS.
b) It highlights potential bottlenecks.
c) It is a means to assist the planners to level the load.
d) It is a means of managing work-in-progress on the factory floor.
e) It provides the plan with an indication of future loads at the critical resources.
f) Load profiles can be set up for any resource that is classified as critical. (6)

1.7

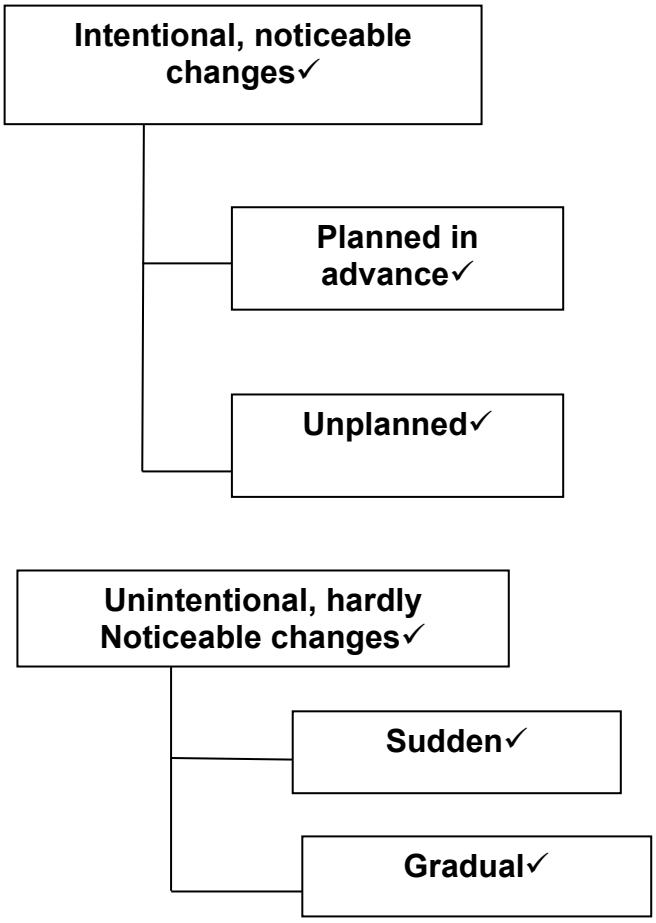
| Months | Jan | Feb | March | April | May |
|---|---|---|---|---|---|
| **Sales Forecast (units)** | 4500 | 4700 | 5200 | 5500 | 6500 |
| **Production Plan (units)** | **4815**✓ | **5029**✓ | **5564**✓ | **5885**✓ | **6955**✓ |
| **Load (hours)** | **601.875**✓ | **628.625**✓ | **695.50**✓ | **735.625**✓ | **869.375**✓ |

(10)
**[33]**

## SECTION B: SHOP FLOOR MANAGEMENT/PRODUCTION ACTIVITY CONTROL

## QUESTION 2

2.1




(6)

2.2 Six sigma: Set of techniques and tools for process improvement.✓✓ (2)

2.3

| Weeks | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Actual Input | 250 | 280 | 290 | 320 | 350 |
| Actual Output | 240 | 281 | 285 | 325 | 340 |
| Weekly Variance | 10✓ | (1)✓ | 5✓ | (5)✓ | 10✓ |
| Cumulative Variance (or WIP) | 10✓ | 9✓ | 14✓ | 9✓ | 19✓ |

(10)

2.4 (a) Executing the Master production schedule.
(b) Controlling the sequence and priority of work on the shop floor.
(c) Improving the efficiency of the operations on the shop floor.
(d) Maintaining low stock levels.
(e) Improving services to customers. (5)

2.5 (a) Customer orientation
(b) Continuous process improvement
(c) Employee participation
(d) Leadership (4)

2.6
- The Buffer is small work in progress just before the bottleneck to ensure that it is never starved of work.✓✓
- The Rope is the production schedule for other parts of the process, which is based on the capacity of the bottleneck activity to balance the entire process.✓✓ (2 × 2) (4)

**[31]**

## SECTION C: INVENTORY MANAGEMENT

## QUESTION 3

3.1 a) Receipt of purchasing requisitions or orders
b) Revision of purchasing requisitions
c) Selection of suppliers
d) Compiling a price register
e) Placing of orders
f) Monitoring of orders
g) Receiving of goods (7)

3.2 a) Cost of capital (Interest costs).
b) Storage and handling costs (space costs).
c) Obsolescence, depreciation, spoilage, theft and insurance costs (risks costs). (3)

3.3

$$EQ = \sqrt{\frac{2 \times V \times B}{P \times K}}\checkmark$$

$$EQ = \sqrt{\frac{2 \times 2500 \times R\ 50}{0.25 \times 2.5}}\checkmark$$

$$EQ = \sqrt{\frac{250\ 000}{0.625}}$$

$$EQ = \sqrt{16\ 00\ 000}$$

$$EQ = 632.455\checkmark$$

(3)

3.4 3.4.1 FIFO method

- Under FIFO (first-in-first-out) the 1000 units issued are assumed to be allocated as 2000 units from day 1 and 1000 units will be left from day 1.✓
- Therefore, the value of the remaining stock is: 1000 from day 1 at a value Of R40/unit and 1500 units from day 2 at a rate of R35/unit:✓

= (1000 × R40) + (1500 × 35)
= R92 500 (1 mark)✓ (3)

3.4.2 LIFO method

- Under LIFO (last-in-first-out) the 1000 units issued are assumed to be from be allocated from day 2.✓
- Therefore, the value of the remaining stock is 2000 from day 1 at R40/unit and 500 units from day 2 at R35/unit:✓

= (2000 × R40) + (500 × R35)
= R97 500✓ (3)

3.4.3 Weight average method be an issue
Total stock receipt = 2000 + 1500
= 3 500 units✓
Weighted value of stock received on day 1 = $\frac{2000}{3\,500}$ × R 40
= R 22.86 per unit✓

Weighted value of stock received on day 2 = $\frac{1500}{3\,500}$ × R 35✓
= R 15.00✓ (4)

3.5 a) Customer service
b) Inventory investment
c) Manufacturing, purchasing and distribution operations, profitability and return on investment (3)

**[26]**

## SECTION D: PRODUCTION COSTING

## QUESTION 4

4.1 The term *cost* is used for obtaining assets as well as for incurring current expenses.✓✓ (2)

4.2 *Prime cost* is the sum of direct material costs and indirect labour costs.✓✓ (2)

4.3 Costs related to factory superintendents,✓ foremen,✓ supervisors,✓ maintenance staff,✓ inspection staff,✓ personnel who repair defective work,✓ experimental labour costs and the costs of factory assistants whose work is not directly associated with physical production etc. (6)
**[10]**

**TOTAL: 100**

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