higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PRODUCTION AND QUALITY CONTROL N5

13 April 2021

This marking guideline consists of 5 pages.

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QUESTION 1

1.1 Centre of gravity
1.2 Shop floor management
1.3 Simple
1.4 Cost
1.5 Sum

(5 × 2) **[10]**

QUESTION 2

2.1 F
2.2 C
2.3 A
2.4 B
2.5 D

(5 × 2) **[10]**

QUESTION 3

3.1
- Under a make-to-order policy, products are only manufactured when specifically ordered by customers.
- No stock of finished goods is carried.
- Advantage: the cost of carrying inventory is reduced.
- Under a make-to-stock policy, products are manufactured based on forecasts of demand.
- They are then put into stock of finished goods until sold.
- Advantage: Capacity management can be better utilised to lower the production costs. (2 × 3) (6)

3.2 3.2.1
- Just-in-time (JIT) is a manufacturing strategy in which jobs are planned to arrive at a work centre just in time for processing.
- It is also concerned with the continuous elimination of waste. (2)

3.2.2
- Reductions in lead times
- Reductions in stocks/inventory
- Smaller batches are produced.
- Total quality management is introduced at each work centre.
- Each work centre is responsible for its own quality. (4)

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3.3

Activity	Days														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A															
B															
C															
D															
E															
F															
G															

(TWO marks for correct layout) (2)
(ONE mark for each activity correctly plotted) (7)
(Overall length of project is 15 days) (1)

3.4
- The planning is clear and logical because the project is portrayed in a visible, diagrammatical form.
- Definite start and completion dates are visible.
- Resources can be allocated more accurately because of the visibility of the schedule.
- The critical work centres are highlighted and can be given more attention to ensure the smooth running of the project.
- Communication is improved by the visibility of the schedule. (Any 4 × 1) (4)

[26]

QUESTION 4

4.1 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 which 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)

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

4.3
- 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 by departments in which similar activities are performed together. Just-in-Time operations group activities necessary for products with similar production requirements together in a processed-based layout, where teams work in manufacturing cells using equipment dedicated to the production of those products only.
- Reduction of work-in-progress:
  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 set-up 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 for defects to be passed on down the line and doing work `right first time` becomes essential at each work station. In-line quality checks and process improvement by shop floor employees, as well as giving them authority to stop the production line when a problem cannot be fixed quickly. (4 × 3) (12)

[30]

QUESTION 5

5.1 5.1.1 Under FIFO (first-in-first-out) the 650 units issued are assumed to be from the first receipt, i.e. form day 1, therefore the value of the remaining stock is:✓
(650 – 650) at R24 + 1 200 units at R19 = R22 800✓✓

5.1.2 Under LIFO (last-in-first-out) the 650 units issued are to be from the most recent receipt, i.e. from day 2, therefore the value of the remaining stock is:✓

650 at R24 + (1 200 – 650) at R19 = R26 050✓✓

5.1.3 The weighted average method (√ = ½ mark)

Total stock receipt = 1 200 + 650 = 1 850√

Weighted value of stock received on day 1
= 650/1 850 × R24 = R8,43√

Weighted value of stock received on day 2
= 1 200/1 850 × R19 = R12,32√

Therefore the total weighted average value of stock
= R8,43 + R12,32 = R20,75√

The value of the remaining stock is (1 850 – 650) × R20,75
= R24 900✓

(3 × 3) (9)

5.2
- To keep capital investment in stock at minimum. The investment in inventory represents a substantial amount in many businesses. It is not uncommon that 25% of the total capital employed in manufacturing industries is invested in inventory.✓✓
- To effect savings in storage costs✓
- To prevent damage, theft and the spoilage of stock✓
- To eliminate, where possible, unnecessary varieties and to promote the standardisation of raw materials, parts and equipment.✓✓
- To prevent inventory losses resulting from poor inspection on receipt.✓
- To ensure the availability of sufficient stock of raw materials, parts and indirect materials, so that the production department will not experience any shortage of stock.✓✓
- To ensure the efficient transportation of stock including transport to the plant, handling during manufacturing and transport to the client.✓
- To undertake demand forecasting, in order to determine inventory requirements.✓
- To liaise with the purchasing department so that economic purchasing can take place.✓
- To design an efficient inventory information system which may, in turn, serve as a basis for efficient production planning, efficient purchasing, correct cost accounting and precision in the compilation of financial statements.✓✓✓

(15)
[24]

TOTAL: 100

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