ME3302 - Assignment - 01

KARTHIK S
ME18B149

2.3)

Part A:

~~Let Q_1 be quantity of~~

Annual production : 3600 units

Components / unit : 47

Components / unit made in plant: 40% of 47

$\approx$ 19 components.

~~Compo~~ purchased: $\approx$ 28

Part B:

Annual production: 2500 units

Components / unit: 52.

made in plant: 30% of 52

$\approx$ 16

purchased: 36

$\Rightarrow$ Total no. of components:

(a) made in plant:

$= 19 \times 3600 + 16 \times 2500$

$= 108400$

(b) purchased:

$= 28 \times 3600 + 36 \times 2500$

$= 190800$

2.5)

8 models:

Each model: 900 units.

Each unit: 180 components.

Each component: 6 processing operations

Each processing operation: 1 min.

(a) Total number of components per year

$180 \times 900 \times 8 = 1296000$

(b) Processing operations per year

$6 \times 180 \times 900 \times 8 = 7776000$

(c) Total time: $1 \times 6 \times 180 \times 900 \times 8$

$= 7776000$ min $= 129600$ hrs.

$\Rightarrow$ No. of workers: $\frac{129600}{2000} = 64.8$

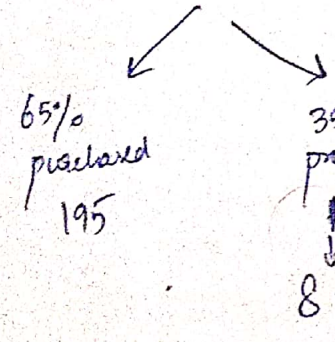
≈ 65

2-6)

10 models

1000 units/model. Assembly time: 48min/unit

300 components/unit ~~Assembly time.~~



↓

8 processing operations/component.

(a) Processing operations: $(8 \times 105) \times 1000 \times 10 = \boxed{8400000}$

Assembling operation: $10 \times 1000 = \boxed{10000}$

→ ~~Total: 8410000~~

(b) Processing time: $8400000 \times 0.5\text{min} = 4200000\ \text{min}$.

Assembly time: $10000 \times 48 = 480000\ \text{min}$

⇒ Total time: $4680000\ \text{min}$.

⇒ No. of workers: $\frac{4680000/60}{2000} = \boxed{39}$

(c) Total floor space:

Since Single shift: No. of workcell + No. of workstation. 39

⇒ Area: $39 \times 25 = 975\ m^2$

Allowance: 45%

⇒ Final area: $1413.75\ m^2$