

University Business

Name: _____ Score: _____

1. Proof takes 24 minutes a batch in three slots. Capacity in batches an hour?
_____ batches/hr
2. Centre 80, sd 2, samples of 5. The upper control limit for sample means (two decimals)?
_____ g
3. $D = 48,000$ kg, $S = 50$, $H = 1.20$. The EOQ in kg?
_____ kg
4. Naive errors 40, -20, 60, 20, 40, -20, 60. The MAD (one decimal)?
_____ buns
5. Two depots, each weekly sd 300 and independent, $z = 1.645$. Pooled safety stock, to the nearest unit?
_____ units
6. Which crash first, and why?
 - ☐ H - it is last
 - ☐ G - it has only one day of float
 - ☐ C - critical, and 400 a day is below the 700 a day it saves
 - ☐ E - it is the cheapest to shorten
7. A renewable tariff at 0.06 kg/kWh does what to the footprint?
 - ☐ the whole 3,000 kg halves too
 - ☐ nothing - tariffs are paperwork
 - ☐ electricity 1,824 to 576; the site halves to 1,244; the flour is unchanged
 - ☐ flour emissions fall too
8. After a second mixer (mix 10.00), where is the bottleneck?
 - ☐ mix at 10.00
 - ☐ proof at 7.50
 - ☐ pack at 10.00
 - ☐ bake at 6.67 an hour
9. Sample 6 reads 82.9 against an upper limit of 82.68. The right response?

- ☐ ignore it - one point is noise
- ☐ widen the limits to 83
- ☐ find the nameable cause - the flour lot changed
- ☐ retune the mixer by minus 0.5 g

10. At the EOQ, how do annual ordering and holding costs compare?

- ☐ equal - 1,200 each
- ☐ holding is double ordering
- ☐ it depends on the price of flour
- ☐ ordering is double holding

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1. **7.5 batches/hr**

$$60 \times 3/24 = 7.5.$$

2. **82.68 g**

$$80 + 3 \times 2/\sqrt{5} = 82.68.$$

3. **2000 kg**

$$\sqrt{2 \times 48,000 \times 50/1.2} = \sqrt{4,000,000} = 2,000.$$

4. **37.1 buns**

$$260/7 = 37.1.$$

5. **698 units**

$$1.645 \times \sqrt{300^2 + 300^2} = 1.645 \times 424.3 = 698.$$

6. **C - critical, and 400 a day is below the 700 a day it saves**

Only critical days shorten the project; C is on the path and cheapest per day.

7. **electricity 1,824 to 576; the site halves to 1,244; the flour is unchanged**

Scope 2 moves with the tariff - 2,492 to 1,244, a 50% fall on site but only 42% cradle-to-gate; scope 3 needs the chain.

8. **bake at 6.67 an hour**

The constraint moves to the next-slowest station - bake at 6.67.

9. **find the nameable cause - the flour lot changed**

Beyond the limits is a special cause; find it rather than nudge the process.

10. **equal - 1,200 each**

The EOQ is defined by the balance: $D/Q \times S = Q/2 \times H$.