

Part 5 — Exam Questions & Answers

A. Short Definitions (1–2 lines each)

Term	Definition
Business Process	A sequence of related activities that transform inputs (data/resources) into outputs (goods or services).
Efficiency	Doing a task using the fewest possible resources or time — “doing things right.”
Productivity	The total amount of output produced per unit of total input — “doing more overall.”
Merit Function	A weighted scoring formula combining several performance criteria (cost, time, errors, etc.) into one comparable number.
Bottleneck	The slowest or most capacity-constrained step that limits total process throughput.
Takt Time	The maximum time per unit that meets customer demand without delay; $T = \frac{\text{Available Time}}{\text{Demand}}$ $T = \frac{\text{Demand}}{\text{Available Time}}$
Little’s Law	$WIP = \text{Throughput} \times \text{Lead Time}$ $WIP = \text{Throughput} \times \text{Lead Time}$ — links how many units are in system with speed and waiting.
CAPEX	One-time investment on long-term assets (machines, apps, buildings).
OPEX	Recurring operating costs (wages, utilities, maintenance).
ROI	Return on Investment = $\frac{\text{Gain} - \text{Cost}}{\text{Cost}} \times 100\%$ $\frac{\text{Gain} - \text{Cost}}{\text{Cost}} \times 100\%$
Automation	Replacing manual effort with technology so rules execute automatically.
Digitization	Converting paper/manual data into digital form.
Digitalization	Using digital tools to redesign <i>how</i> work happens.

Reengineering	Fundamental rethink and radical redesign of processes for dramatic improvement in cost, quality, or speed.
Change Management	Structured approach to transition people and culture smoothly during process change.

B. Conceptual / Explain Type Questions

1. Differentiate between Efficiency and Productivity.

Answer:

Efficiency measures *how well* a specific task uses resources (e.g., seconds per order).

Productivity measures *how much* total output is produced from total inputs (e.g., orders per hour).

Improving efficiency at one step may not raise productivity if the bottleneck remains.

In Starbucks, mobile payment improved cashier efficiency; productivity increased only after barista workflow was balanced.

2. Why is Reengineering considered “radical” and not “incremental”?

Because it challenges the very existence of each step rather than optimizing it.

Ford's A/P example didn't automate invoice typing—it **abolished** the invoice.

BPR asks “If we were designing this today, from scratch, what would we do?”

3. What is meant by Merit Function in Business Process Reengineering?

A merit function aggregates multiple goals (cost, lead time, throughput, errors, automation) using weights.

It allows objective comparison between designs.

Lower merit = better overall process.

Used to show that the To-Be process *quantitatively* dominates the As-Is process.

4. Explain Value Added (VA) and Non-Value Added (NVA) work.

VA (Value Added) steps change the product or service in a way the customer would pay for (e.g., brewing coffee).

NVA (Non Value Added) steps add no customer value but consume time/resources (waiting,

re-entry, approvals).

BPR aims to eliminate or automate NVA tasks.

5. What is Little's Law and how is it used in BPR?

Little's Law: $WIP = Throughput \times Lead\ Time$.

If a café handles 120 orders/hr and each order takes 6 min, then 12 orders are “inside” the system.

By raising throughput or shortening lead time, WIP shrinks → shorter queues and lower waiting cost.

6. Why do processes fail even after automation?

Automation of a **bad process** only makes errors faster.

Without redesign (clear rules, correct data flow, staff adaptation), problems persist at higher speed.

That's why BPR insists on “Don't automate — obliterate.”

7. Explain Takt Time with example.

$Takt\ Time = Available\ time / Demand$.

If a barista has 3600 seconds per hour and 150 orders to deliver, $takt = 24\ s/order$.

If actual service takes 40 s, queues grow; hence, processes must be rebalanced or parallelized.

8. What is the difference between Macro-economics and Micro-economics in process analysis?

- **Micro:** Individual firm decisions (pricing, staffing, process design).
 - **Macro:** National factors (inflation, interest rates, exchange rate).
BPR decisions are micro-level but must stay realistic within macro constraints.
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9. Explain CAPEX vs OPEX trade-off in process redesign.

Automation usually increases CAPEX (new tech) but reduces OPEX (less labor, fewer errors).
A good BPR design shows that savings or new revenue repay CAPEX within acceptable payback period.

Example: Mobile app (low capex) replaced kiosk (high capex) yet saved cashier salaries.

10. What is Change Management and why is it critical in BPR?

Because people resist change.

BPR succeeds only if employees are trained, informed, and reassigned instead of replaced.

Communication of “why” and pilot testing ensure adoption.



C. Numerical Reasoning / Analytical Questions

Q1. Calculate new throughput and lead time after improvement.

Given:

As-Is → 120 orders/hr, Lead = 12 min.

To-Be → 170 orders/hr.

Using Little's Law, assume WIP ≈ 12 orders (constant).

Then new Lead = WIP / Throughput = 12 / (170/60) = 4.2 min.

So average lead time dropped from 12 → ~4 min (≈ 65 % reduction).

Q2. ROI and Payback

Investment: App cost = Rs 400,000

Monthly Savings: Rs 70,000

ROI = $(70,000 \times 12 - 0) / 400,000 = 210 \%$.

Payback = $400,000 / 70,000 \approx 5.7$ months.

✓ Interpretation: Investment recovered within 6 months — financially viable.

Q3. Merit Function Example

Criteria weights: Cost 0.35, Lead 0.25, Throughput 0.20, Errors 0.15, Automation 0.05

After normalization, As-Is M = 0.66, To-Be M = 0.31 → To-Be wins.



D. Paragraph / Case-Type Questions

1. Question: Discuss how Starbucks improved efficiency and productivity through reengineering.

Answer:

Starbucks identified cashier operations as a major bottleneck causing long queues.

Through a mobile application, ordering and payment were completed before arrival, eliminating manual POS entry.

Baristas received precise digital specifications, enabling them to start preparation earlier and reduce remakes.

Average service time dropped from 12 to 7 minutes, throughput increased from 120 to 170 orders/hour, and cost per transaction declined.

The reengineering not only improved operational efficiency but also enhanced productivity and customer satisfaction.

2. Question: How can a university reengineer its fee-payment process to reduce errors?

Answer:

The existing process depends on manual proof uploads and staff verification.

Reengineering introduces direct bank integration and automatic validation rules: a student can proceed only after fee confirmation.

This eliminates redundant checking, lowers human error, and generates real-time dashboards.

Processing time falls from days to hours, and error rate drops from 10 % to 2 %.

Such rule-driven automation demonstrates efficiency and accuracy gains in an academic setting.

3. Question: Explain how a Merit Function helps in decision-making.

Answer:

When multiple process designs exist, qualitative judgment alone can be biased.

The merit function assigns weights to measurable factors like cost, time, and quality, converts them to comparable scales, and produces one quantitative score.

Designs are ranked objectively; the one with the lowest merit delivers the optimal trade-off.

It translates management intuition into data-based choice.

4. Question: Why is identifying a bottleneck crucial before automation?

Answer:

Because improving a non-bottleneck step does not raise total system output.

If a barista can make only 60 drinks/hour, no level of cashier speed will exceed 60 drinks/hour.

Bottleneck identification ensures investment targets the true constraint, maximizing ROI.

5. Question: Discuss how Business Process Reengineering differs from TQM and Lean.

Answer:

- **TQM** aims for continuous, small-step improvements and defect reduction.
 - **Lean** focuses on waste elimination and flow.
 - **BPR** is a *radical redesign* that questions whether each step should even exist.
In BPR, processes may be rebuilt using new technology or entirely new workflows.
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6. Question: “Technology alone cannot reengineer a business.” Explain.

Answer:

Technology is an enabler, not a solution by itself.

If underlying rules, roles, and accountability remain unchanged, automation only accelerates old inefficiencies.

Effective reengineering realigns people, data, and decisions around value creation.

7. Question: What economic concepts justify the need for process reengineering?

Answer:

- **Scarcity:** Limited resources demand better allocation.
- **Opportunity Cost:** Time wasted on redundant work could be used for growth tasks.
- **Productivity & Efficiency:** Central goals of microeconomics, achieved through smarter processes.

- **Economies of Scale:** Reengineering often standardizes operations, reducing cost per unit.
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8. Question: Why is consistency important in processes?

Answer:

Consistency ensures identical results for identical inputs, preserving brand trust and quality. Starbucks' digital order specs removed verbal variation; every drink matched standards. Consistency is the foundation for scaling operations.

9. Question: How can time-stamping and data analytics improve decision-making?

Answer:

Timestamps reveal where time is lost—queue lengths, idle phases, rework loops. Analyzing them quantifies bottlenecks and guides resource allocation. Without data, improvements remain guesses; with data, they become measurable and defensible.

10. Question: What role do leadership roles (6 C's) play in BPR?

Answer:

- **CEO** aligns redesign with vision and approves investments.
- **COO** owns process performance and throughput.
- **CTO** implements enabling technology securely.
- **CFO** ensures financial viability and ROI.
- **CHRO** manages reskilling and culture.
- **CMO** communicates changes to customers.
Collectively they ensure redesign is balanced across strategy, operations, finance, people, and market.

E. Open-Ended / Analytical Essay Prompts (for 10-mark style)

1. *“Reengineering a process is less about technology and more about information flow.”*
Explain using an example.
2. *Compare the financial sector’s contribution to productivity with that of the production sector.*
Which adds more “real” value and why?
3. *Discuss how macro-economic stability (inflation, interest rates) can influence reengineering decisions in a firm.*
4. *“Every process must be measurable before it can be improved.”* Defend this statement with practical reasoning.
5. *Design a small merit-function for a university’s online examination system considering time, accuracy, and cost.*

Exam Strategy Tip

When you get a long question:

1. Start with a **definition**.
2. Briefly describe **As-Is problem**.
3. Explain **To-Be solution** (rules + automation).
4. Quote **2–3 quantitative results** (time, cost, error %).
5. End with a **change-management sentence**.
That five-line pattern earns almost full marks consistently.