Phal & Frost: worked answers (Week 13 Lab)

NST Founder Lab | Solutions to the case questions | All company figures and offers are fictional.

SOLUTIONS 1–2

Labels and October economics

1 | Business map

Activity: manufacturing plus retail and B2B supply. Model: company-owned outlets and credit corporate orders. Ambition: searching for repeatable regional growth. Scale: a small operating business in ordinary language; the case supplies no statutory MSME certification and students need not assign one. Legal form: private limited company. "Startup", "SME", "manufacturer" and "private company" are not mutually exclusive alternatives. Franchising can divide store investment and operating work by contract. The company still needs product/brand quality controls, safe supply, training, replenishment and contractual oversight. It does not make inventory, support or reputational responsibility vanish.

2 | Worked calculations

Measure	Calculation	Answer
Variable cost per serving	₹6,00,000 / 12,000	₹50
Contribution per serving	₹100 - ₹50	₹50
Contribution margin	₹50 / ₹100	50%
Total October contribution	12,000 × ₹50	₹6.00 lakh
Operating cash break-even	₹3,00,000 / ₹50	6,000 servings
October profit before tax	12 - 6 - 3 - 0.4 - 0.1	₹2.50 lakh
PBT break-even volume	₹3,50,000 / ₹50	7,000 servings

The operating cash break-even intentionally excludes depreciation, interest, debt principal, capital expenditure and working-capital movements. It is not the number of sales needed to make every cash obligation in a real month. The second break-even includes depreciation and interest, but still assumes one equivalent product, unchanged unit economics and capacity.

SOLUTION 3

Two reconciliations and one balance sheet

Cash bridge	₹ lakh
Opening cash	3.00
Customer receipts	+9.00
Supplier payments	-5.80
Fixed cash expenses	-3.00
Interest paid	-0.10
Freezer purchase	-2.00
Loan-principal repayment	-0.50
Closing cash	0.60
Net cash change	-2.40
Profit-to-cash bridge	₹ lakh
Profit before tax	2.50
Add depreciation	+0.40
Increase in receivables: 5 - 2	-3.00
Increase in inventory: 1.8 - 1	-0.80
Increase in payables: 2 - 1	+1.00
Operating cash after interest	0.10
Freezer capex and principal repayment	-2.50
Net cash change	-2.40

Closing receivables = 2 + 12 - 9 = 5. Closing payables = 1 + 6.8 - 5.8 = 2. Closing net PPE = 8 + 2 - 0.4 = 9.6. Loan principal = 4 - 0.5 = 3.5. Equity = 9 + 2.5 = 11.5. No dividends or new financing.

31 October assets	₹ lakh	Liabilities and equity	₹ lakh
Cash	0.60	Trade payables	2.00
Receivables	5.00	Loan principal	3.50
Inventory	1.80	Total equity	11.50
Net PPE	9.60		
Total	17.00	Total	17.00

Operating working capital rises from ₹2.0 lakh (1 + 2 - 1) to ₹4.8 lakh (1.8 + 5 - 2), absorbing ₹2.8 lakh. Profit plus depreciation is ₹2.9 lakh, leaving ₹0.1 lakh operating cash after interest. Capex and debt principal use ₹2.5 lakh more. Bank cash falls ₹2.4 lakh despite the profit.

SOLUTION 4

Pay the supplier without inventing liquidity Today's mandatory cash payments are 1.20 + 0.40 = ₹1.60 lakh. Starting cash is ₹0.60 lakh. Shortage to pay bills is ₹1.00 lakh; shortage including the ₹0.20 lakh reserve is ₹1.20 lakh.

Response alone	Today's extra funds / deferral	End cash today	Cost / later obligation
A. Early collection	1.50 × 95% = 1.425 received	0.60 + 1.425 - 1.60 = 0.425	Discount 0.075; no loan repayment. Invoice settled.
B. Bridge	1.20 received	0.60 + 1.20 - 1.60 = 0.20	Fee 0.024; repay 1.224 on day 30.
C. Extension	0.70 deferred; today pays 0.50 supplier + 0.40 payroll	-0.30: infeasible	Fee 0.035 plus 0.70 deferred principal due day 30. Needs another 0.50 to meet reserve today.

Day-30 stress check

Response	Base cash after settlement	Downside cash after settlement
A	0.425 + 1.35 = 1.775	0.425 + 0.80 = 1.225
B	0.20 + 1.35 - 1.224 = 0.326	0.20 + 0.80 - 1.224 = -0.224

The day-30 forecasts explicitly exclude the early-collected invoice and retained emergency proceeds. Offer A does not receive the ₹1.50 lakh again on 20 November. Its permanent discount is ₹7,500, not an interest rate. Offer B's fee is ₹2,400, but the downside fails both repayment and the minimum reserve. A minus sign is a financing need, not an actual permissible negative bank balance. Recommended judgement Offer A alone is a defensible conservative response: it pays both obligations, preserves the reserve and removes the day-30 emergency repayment. It is more expensive in absolute fee/discount than B but survives the supplied downside. B is defensible only with a credible, quantified backup source or different risk assumption that students explicitly name. C alone is impossible. A combination requires reconciled flows and later obligations; paying extra fees for unused liquidity needs an argument. If A is chosen, receivables fall by 1.50 and a 0.075 discount/loss arises in November, not October. If B is chosen, cash and debt rise; loan proceeds are not revenue. If C is chosen, deferral changes the due date, not the existence of the liability. Avoid annualising different-duration offers as if that resolves repayment risk.

SOLUTION 5 | DEBT

A smaller payment can conceal a larger risk

Month-1 metric	Bank loan	NCD
Opening funding	10.00	10.00
Interest / monthly coupon	10 × 12% / 12 = 0.10	10 × 15% / 12 = 0.125
Monthly principal / prudent reserve	0.50 principal repaid	10 / 24 = 0.416667 reserved
Month-1 cash burden including reserve	0.60	0.541667
Base cash remaining	1.10 - 0.60 = 0.50	1.10 - 0.541667 = 0.558333
Downside cash remaining	0.35 - 0.60 = -0.25	0.35 - 0.541667 = -0.191667

NCD contractual payment during months 1–23 is only ₹0.125 lakh coupon; base cash after coupon is ₹0.975 lakh and downside cash after coupon is ₹0.225 lakh. But the full ₹10 lakh is due at month 24. A reserve is prudent cash discipline, not an extra contractual payment to the lender. Saving ₹10/24 each month at zero return funds the bullet at maturity; simply noticing that coupon is affordable misses the balloon risk. What changes after month 1? Bank principal falls each month. Month 2 interest is 9.5 × 1% = ₹0.095 lakh; payment is ₹0.595 lakh. Under the stated constant-cash simplification, month 1 is the highest scheduled bank cash burden. Total bank interest over 20 months is 1% × (10 + 9.5 + … + 0.5) = ₹1.05 lakh. NCD coupon over 24 months totals ₹3 lakh. These totals refer to different repayment patterns and tenors, so they are not a complete valuation or a stand-alone choice rule. Possible decision The base forecast services either debt structure with a reserve, but the downside does not. This supports delaying the third outlet until collections and operating evidence improve, or choosing equity if the founders accept its ownership cost and investor terms. An NCD recommendation must not rely on an unexplained refinance at maturity. The case deliberately ring-fences project cash. Do not use the emergency discount proceeds twice, assume retained earnings are cash, or move old-company bank cash into the project after the instructions prohibit it. The forecasts are not guarantees.

SOLUTION 5 | EQUITY

New money and new shares Pre-money equity value ₹40 lakh ÷ 1,00,000 existing shares = ₹40 per share. A ₹10 lakh new issue creates 25,000 shares. Post-money equity value is ₹50 lakh. There are now 1,25,000 shares.

Holder	Before shares	After shares	After ownership
Asha	70,000	70,000	56%
Kabir	30,000	30,000	24%
New investor	0	25,000	20%
Total	1,00,000	1,25,000	100%

The founders keep their share counts but own a smaller fraction: combined ownership falls from 100% to 80%. This is dilution from a new issue, not the founders selling their old shares. Equity has no contractual interest or principal payment in this case, but it gives away a share of future upside and may affect governance. It is not free capital. The alternative email is a secondary sale Asha sells 25,000 existing shares at ₹40, receiving ₹10 lakh personally. The company receives ₹0. Total shares remain 1,00,000. Asha has 45%, Kabir 30% and buyer 25%. That transaction alone cannot fund the company's ₹10 lakh project. A later contribution by Asha would be another transaction, which is not part of the given offer. Why no dividend calculation? No dividend or buyback is promised. Accounting retained earnings do not guarantee cash available for distributions. A shareholder's expected return differs from a creditor's scheduled repayment. A strong board recommendation A defensible recommendation is: settle the immediate bill with early collection; delay the third outlet; fix collections and test the operating change first. If the board insists on expansion now, equity avoids the stated debt-service downside, but the founders must weigh 20% dilution and agree governance. There is no single compulsory "correct" financing choice divorced from the supplied risks and priorities.

SOLUTIONS 6–7

Better retention, weaker measured contribution

Measure	Group A	Group B
Previous repeat-purchase rate	80 / 200 = 40%	82 / 200 = 41%
Test repeat-purchase rate	90 / 200 = 45%	110 / 200 = 55%
Change from own prior window	+5 percentage points	+14 percentage points
Test contribution before campaign cost	90 × ₹50 = ₹4,500	110 × ₹45 = ₹4,950
Net test contribution	₹4,500 - ₹0 = ₹4,500	₹4,950 - ₹800 = ₹4,150

Group B's repeat rate is 10 percentage points higher in the test window, but its net contribution is ₹350 lower for an equal-sized cohort. Its before/after increase exceeds A's by 9 percentage points. That is a descriptive difference, not a proven causal campaign effect: groups were pre-existing, not randomised, and may differ in other ways. No previous-window contribution is given, so a before/after profit change cannot be calculated. An example next test Owner: delivery coordinator with Kabir reviewing cash. Randomly assign comparable eligible customers to usual service, reminder-only and reminder-plus-credit groups for the same 30-day window. Log all credits and campaign costs. Primary metric: net contribution per eligible customer after variable and campaign costs. Continue the change only if that metric exceeds the control by a pre-agreed margin, such as ₹2 per eligible customer, without worse spoilage or service complaints. Review the following 30 days before assuming retention lasts. ₹2 is a proposed decision rule, not a result from the given data. A sample-size/power calculation would be needed for a rigorous statistical claim. The menu/spoilage trend suggests another possible test, but does not prove causality. A smaller safe-stock/menu trial should retain food-safety and availability guardrails.

7 | Example 60-second board statement

"October profit was ₹2.5 lakh, but cash fell ₹2.4 lakh to ₹0.6 lakh. Working capital absorbed ₹2.8 lakh and capex plus loan principal used ₹2.5 lakh. We will collect the ₹1.5 lakh invoice early for ₹1.425 lakh, pay the supplier and payroll, and retain ₹0.425 lakh. We will delay the third outlet: the project's downside cash fails the bank payment by ₹0.25 lakh and the NCD's coupon-plus-reserve by about ₹0.192 lakh. We will assign collections ownership and retest the reminder without assuming discounts pay for themselves. We would reconsider expansion if measured operating cash reliably covers its downside obligations."