Questions	WCM PART4 - Inventory Management
1	HW Typed
2	HW Typed
3	HW Typed
4	CW
5	Handwritten solution provided
6	Handwritten solution provided
7	HW Typed
8	CW
9	CW
10	CW

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}}$$

A → Annual Demand / Monthly demand

C → Annual carrying cost / Monthly carrying cost

Ref 4 @ (when we assume carrying cost given is for annum) (Per annum)

- Annual Demand = $\frac{6300 \text{ units}}{10} \times 365 = 630 \times 365 = A$
- Carrying cost = 0.26 per unit (Per annum assumed)
- Ordering cost = ₹ 10.

$$EOQ = \sqrt{\frac{2 \times A \times O}{C}} = \sqrt{\frac{2 \times 630 \times 365 \times 10}{0.26}} = 4206 \text{ (approx)}$$

(b) If carrying cost given was only for 10 days (assumed)

A = 10 day demand = 6300 unit
C = carrying cost for 10 day = 0.26
O = ₹ 10.

$$EOQ = \sqrt{\frac{2 \times 6300 \times 10}{0.26}} = 696 \text{ units (approx)}$$

Sol(5) $A = 60{,}000$ Tonne

$O = ₹100$

$C = ₹0.10$ per Tonne per annum.

Current Policy $\Rightarrow$ Number of orders $= 2$

$\Rightarrow$ ROQ $= \frac{60{,}000}{2} = 30{,}000$ Tonne

ROL $= 10{,}000$ Tonnes.

(i) $EOQ = \sqrt{\frac{2 \times 60000 \times 100}{0.10}} = 10954$ Tonne approx.

Correct ROL = Maximum Consumption × Maximum lead Time

$= \left(\frac{60{,}000}{30 \text{ weeks}}\right) \times 2 \text{ weeks} = 2400$ Tonne

Extra ROL maintained in current Policy $= 10{,}000 - 2400$

$= 7600$ Tonne

it means that current Policy keeps extra ROL of 7600 Tonne so it wasts carrying cost.

(ii)

	Current Policy	Proposed EOQ.
ordering cost	$\left(\frac{60000}{30000}\right) \times 100 = ₹200$	$\frac{60000}{10954} \sim 6 \text{ orders} \times 100 = ₹600$
Carrying cost	$\left(\frac{1}{2} \times 30000\right) \times 0.1 + 7600 \times 0.1$ (extra stock kept) $= ₹2260$	$\left(\frac{1}{2} \times 10954\right) \times 0.1 = ₹548$ (approx)
	2460	1148

Extra cost incurred in current Policy = ₹1312

Q6 Purchased lot size = Roq = 1000

O = ordering cost = ₹40

C = Carrying cost = ₹0·10 Pm × 12 = 1·20 P.a P unit

D = 20,000 × 12 = 240,000 p.a.

(a) $EOQ = \sqrt{\frac{2 \times 240000 \times 40}{1.20}}$ = 4000 units.

(b) If C = 0·05 × 12 = ₹0·6 P. unit per annum

$EOQ = \sqrt{\frac{2 \times 240,000 \times 40}{0.6}}$ = 5657 units.

(c) If O = ₹10.

$EOQ = \sqrt{\frac{2 \times 240,000 \times 10}{1.20}}$ = 2000 units.

Sol 8 (i)

Working Capital Policy

(Figures in crores)

Particulars	Conservative	Moderate	Aggressive
Fixed Assets	2·60	2·60	2·60
Current Liability	2·34	2·34	2·34
Current Asset	4·50	3·90	2·60
Sales	12·30	11·50	10·00
EBIT	1·23	1·15	1·00
(a) Net WC (CA−CL)	2·16	1·56	0·26
(c) CR = CA/CL	1·92 Times	1·67 Times	1·11 Times
(b) Rate of Return			
Return on Investment ROI = EBIT/(FA+CA−CL)	25·84%	27·64%	34·97%

(ii)

Financing Policy

	Conservative	Moderate	Aggressive
FA	2·6	2·6	2·6
CL	2·34	2·34	2·34
CA	3·90	3·90	3·90
Sales	11·50	11·50	11·50
EBIT	1·15	1·15	1·15
Short term Debt @ 12%	0·54	1·00	1·50
Long term Debt @ 16%	1·12	0·66	0·16
Equity	2·50	2·50	2·50
CL ⇒ Old CL + Short term Debt	2·88	3·34	3·84

ⓐ Net WC (CA-CL)	3.9-2.88	3.9-3.34	3.9-3.84
	1.02	0.56	0.06
ⓒ CR = CA/CL	3.9/2.88 = 1.35	3.9/3.34 = 1.17	3.9/3.84 = 1.02
ⓑ RoE = EAES/Equity	0.59/2.50 x100	0.60/2.50 x100	0.61/2.50 x100
	23.60%	24%	24.40%
wpo EBIT	1.15	1.15	1.15
- Interest			
Shorten 12%	-0.06	-0.12	-0.18
Lengthen 16%	-0.18	-0.11	-0.03
EBT	0.91	0.92	0.94
- Tax x 35%	-0.32	-0.32	-0.33
EAT & EAES	0.59	0.60	0.61

Working Capital Policy	Investment in Current Assets	Estimated Sales	EBIT
Conservative	4.50	12.30	1.23
Moderate	3.90	11.50	1.15
Aggressive	2.60	10.00	1.00

After evaluating the working capital policy, the Financial Controller has advised the adoption of the moderate working capital policy. The company is now examining the use of long-term and short-term borrowings for financing its assets. The company will use ₹ 2.50 crores of the equity funds. The corporate tax rate is 35%. The company is considering the following debt alternatives:

Financing Policy	Short-term Debt	Long-term Debt
Conservative	0.54	1.12
Moderate	1.00	0.66
Aggressive	1.50	0.16
Interest Rate – Average	12%	16%

You are required to calculate the following:

(1) Working Capital Investment for each policy:

(a) Net Working Capital position; (b) Rate of Return; (c) Current ratio.

(2) Financing for each policy;

(a) Net Working Capital; (b) Rate of Return of Shareholders equity; (c) Current ratio.

Question 9 - Study Material

A firm has the following data for the year ending 31st March, 2017:

	(₹)
Sales (1,00,000 @ ₹ 20)	20,00,000
Earnings before Interest and Taxes	2,00,000
Fixed Assets	5,00,000

The three possible current assets holdings of the firm are ₹ 5,00,000, ₹ 4,00,000 and ₹ 3,00,000. It is assumed that fixed assets level is constant and profits do not vary with current assets levels. ANALYSE the effect of the three alternative current assets policies.

Question 10 - Rtp

The Management of Fibroplast Limited is trying to establish a Current Assets policy. Fixed Assets are ₹ 6,00,000, and the Company plans to maintain a 50% Debt-to-Assets ratio. It has no operating Current Liabilities. The Interest Rate is 10% on all Debts. The Company is considering three alternative Current Asset Policies – 40%, 50% and 60% of Projected Sales. The Company expects to earn 15% before Interest and Taxes on Sales of ₹ 30,00,000. The effective tax rate is 40%. You are required to calculate the expected Return on Equity under each alternative.

Sol 10

Statement for Calculation of ROE

Particulars	40% CA	50% CA	60% CA
CA	40%×30L = 12L	15L	18L
FA	6L	6L	6L
Total Asset	18L	21L	24L
Equity = TA - Debt	9L	10.5L	12L
Debt = 50% of TA	9L	10.5L	12L
EBIT = 15%×30L	₹4,50,000	₹4,50,000	₹4,50,000
− Int @ 10%	×9L = 90,000	×10.5L = −1,05,000	12L = −120000
EBT	3,60,000	3,45,000	3,30,000
− Tax 40%	−144000	− 138000	− 132000
EAES	216,000	2,07,000	198000
ROE = EAE/Equity	216000/900000 24%	207000/105000 = 19.7%	198000/120000 = 16.5%

Sol (9)

Evaluation of CA Policies

Particulars	A	B	C
Sales	20,00,000	20,00,000	20,00,000
EBIT	2,00,000	2,00,000	2,00,000
FA	5,00,000	5,00,000	5,00,000
CA	5,00,000	4,00,000	3,00,000
Return on Asset			
$ROA = \frac{EBIT}{FA+CA}$	$\frac{2}{5+5} \times 100 = 20\%$	$\frac{2}{5+4} \times 100 = 22.22\%$	$\frac{2}{5+3} \times 100 = 25\%$

Comment: ROA is increasing when CA are reducing.

Chapter 10 - Inventory Management 7D

Solution 1 -

Carrying cost per annum = Cost per unit × Carrying cost % p.a.
= ₹ 16 × 0.15 = ₹ 2.40

EOQ = $\sqrt{\frac{2 \times Annual\ consumption\ p.a.\ \times Ordering\ cost\ per\ order}{Carrying\ Cost\ per\ unit}}$

= $\sqrt{\frac{2 \times 40{,}000 \times 480}{2.40}}$ = 4,000 units

Solution 2 -

A = 390 units × 12 = 4,680 units
O = ₹ 40
C = 35% × ₹ 25 = ₹ 8.75

EOQ = $\sqrt{\frac{2 \times A \times O}{C}}$

= $\sqrt{\frac{2 \times 4{,}680 \times 40}{8.75}}$ = 206.85 units

Solution 3 -

(i) **EOQ** = $\sqrt{\frac{2AO}{C}}$

Where,
A = Annual consumption
O = Ordering cost per order
C = Stock carrying cost per unit annum

EOQ = $\sqrt{\frac{2 \times 72{,}000 \times 500}{5\%\ of\ Rs.\ 90}}$

= $\sqrt{1,60,00,000}$ = 4,000 Rims.

(ii) Re-order Level = Normal Lead Time × Normal Usage
= 20 × 240 = 4,800 Rims.

Working Notes:

Normal Usage = $\frac{Annual\ Usage}{Normal\ working\ days\ in\ a\ year}$

= $\frac{72{,}000}{300}$ = 240 Rims.

(iii) Evaluation of quantity Discount Offer

Particulars	EOQ	Discount Offer
Size of order	4,000 Rims	18,000 Rims
No. of orders in year	18	4
Average Inventory (Order size/2)	2,000 Rims	9,000 Rims
Cost:	₹	₹
Ordering Cost @ ₹ 500 per order	9,000	2,000
Inventory carrying cost		
At EOQ: (4,000/2) × ₹ 4.5	9,000	-
At Discount offer: (18,000/2) × ₹ 4.455	-	40,095
Purchase Cost		
At EOQ: 72,000 × ₹ 90	64,80,000	-
At discount offer: 72,000 × ₹ 89.10	-	64,15,200
Total Cost	64,98,000	64,57,295

The total cost is less in case of quantity discount offer. Hence, quantity discount offer should be accepted.

Solution 7 -

Annual Consumption = 36,000 (A)
Ordering Cost = ₹ 250 per order (O)
Carrying Cost = 4.5 ´100 = ₹ 4.5 (C)
Lead Time = 25 days

(i) Reorder Level = Lead Time × Daily Consumption
= 25* {36,000/360} = 2,500 units
(ii) Economic Order Quantity (EOQ) = 2,000 units
(iii) Evaluation of Profitability of Quantity Discount Offer:

(a) When EOQ is ordered

		(₹)
Purchase Cost	(36,000 units ´ ₹ 100)	36,00,000
Ordering Cost	[(36,000 units/2,000 units) ´ ₹ 250]	4,500
Carrying Cost	(2,000 units ´ ½ ´ ₹ 4.5)	4,500
Total Cost		36,09,000

(b)When Quantity Discount is accepted

		(₹)
Purchase Cost	(36,000 units ´ ₹ 99*)	35,64,000
Ordering Cost	[(36,000 units/9,000 units) ´ ₹ 250]	1,000
Carrying Cost	(9,000 units ´ ½ ´ ₹ 99 x 4.5%)	20,048
Total Cost		35,85,048

*Unit Cost = ₹100
Less: Quantity Discount @ 1% = ₹1 Purchase Cost = ₹ 99
Advise – The total cost of inventory is lower if Quantity Discount is accepted. Hence, the company is advised to accept the proposal.