

## INTERMEDIATE EXAMINATION GROUP I (SYLLABUS 2012)

### SUGGESTED ANSWERS TO QUESTIONS DECEMBER 2014

#### Paper-8: COST ACCOUNTING AND FINANCIAL MANAGEMENT

Time Allowed : 3 Hours

Full Marks : 100

The figures in the margin on the right side indicate full marks.

This paper contains three questions. All questions are compulsory, subject to internal choice as per instruction provided against each question.

All working must form part of your answer.

Wherever necessary, candidates may make assumptions and clearly state them.

No Present Value factor table or other table will be provided along with this question paper.

**1. Answer all questions. 2x10=20**

**State with reason, your answers to questions 1.(a) to 1.(d) under the Generally Accepted Cost Accounting Principles & Cost Accounting Standards:**

- (a) Material with invoice value ₹ 10,000 was received in the Stores Dept. The transport cost was ₹ 200. Since the material leaked in transit, damage to other goods of ₹ 350 had to be paid to the transporter. What would be the material cost?
- (b) Bonus at 10% of salary is paid to the foreman who supervises five different production shops producing five different products. How will the bonus be treated in the Cost Accounts?
- (c) A, B, C and D are products produced by a company. Power is supplied to these production units from the in-house power generator. Cost of power generated for a certain period was ₹ 1,00,000. Additionally, the committed cost of standby power shop utilities was ₹ 25,000. The sales value of A, B, C and D were equal and the units produced were in the ratio 1:2:2:3. What amount of power cost will be part of cost of production for each of A, B, C and D? One unit of power is consumed per unit of production of A, B, C & D.
- (d) Products X, Y and Z are manufactured by XYZ Company. Special permit charges of ₹12,00,000 are paid for X and renewable every 4 years. How will the permit charges be treated in Cost Accounts?
- (e) Prime Cost = ₹ 12,50,000; Works Cost = ₹ 20,00,000 and office overheads are 30% of factory overheads. What is the Cost of Production?

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- (f) The variable and semi variable costs of producing 50,000 units are ₹ 6 per unit and ₹12 per unit respectively. If at 20,000 units, these total costs add up to ₹ 4,80,000, what is the amount of fixed cost component of the semi variable cost?
- (g) M. Ltd. does not use any debt in its capital structure. The company has earnings before interest and tax of ₹ 2,00,000 per annum and the capitalization rate is 12%. Assume corporate tax of 30%. Calculate the value of the firm according to MM Hypothesis.
- (h) Ascertain the discounted value at 10% p.a. at the end of year 1 of an investment of ₹2,00,000 to be made at the end of year 2 and ₹ 3,00,000 made immediately.
- (i) The proprietor's fund is ₹45,00,000 and ratio of fixed assets to proprietor's funds is 0.75. Find the amount of net working capital.
- (j) What is the acceptance rule for a project under the internal rate of return parameter?

**Answer: 1.**

(a) Material Cost = 10,000 + 200 = 10,200.

As per CAS, material cost includes purchase cost, transport inwards and excludes any damages or penalty paid to any authority.

- (b) Salary to foreman is production overheads. Bonus paid to foreman is part of this employee cost and is taken as production overhead and charged to the production shop based on his time spent in supervising that shop.
- (c) Cost of power is a utility and hence a direct expense. Direct expense includes the cost of standby utilities. Hence 1,25,000 should be charged to the products in the ratio of units of power per unit of product x no. of products produced. Since units per product are not given, if we assume same rate of power consumption, 125000 in the ratio 1:2:2:3 i.e. 15625, 31250, 31250, 46875 for A, B, C, D.
- (d) Special permit charges are direct expenses for X, amortised at 3,00,000 per annum, assuming annual production period. Permit charges are treated as direct expenses.
- (e) Factory overheads = 7,50,000; Office OH = 30 % = 2,25,000; COP = 22,25,000
- (f) Total Cost at 50,000 units =  $18 \times 50,000 = 9,00,000$ ; Cost at 20,000 = 4,80,000. Difference in costs/ diff. in qty =  $4,20,000/30,000 = ₹ 14$  per unit. At 20,000 level, Variable cost = 14 x 20,000 = 280,000. Hence fixed cost component = 480,000-280,000 = 2,00,000
- (g)  $V_u = EBIT (1-t)/K_0 = 2,00,000 (0.7)/0.12 = 11,66,667$
- (h) P.V. =  $3,00,000 (1.1) + 2,00,000/1.1 = 3,30,000 + 1,81,818 = 5,11,818$ .
- (i) Fixed Assets =  $0.75 \times 45,00,000$ ; FA 33,75,000.  
Net Current Assets = Proprietors Funds – Fixed Assets  
 $= 45,00,000 - 33,75,000 = 11,25,000$   
 $\therefore$  Net working capital = Net current assets.
- (j) If IRR of the project 'r' is  $> K$ , the cost of capital, accept the project. If  $r < K$ , reject the project; If  $r = K$ , indifference point, i.e. accept or reject.

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### 2. Answer any three questions:

16x3=48

- (a) (i) The standard time per unit is 10 minutes. Time available in a day is 8 hours. Hourly rate of labour is fixed on a piece rate of ₹ 5. X produces 60 units a day and Y produces 72 units a day. What will be each of their daily earnings under Piece-rate and Rowan Scheme? 4
- (ii) How will you treat the different types of idle time cost? 4
- (iii) The following details are available relating to a consignment of 1,200 kgs of material X despatched by the supplier on an order:
- (a) Basic Invoice price = ₹ 20 per kg (without considering trade discount)
  - (b) Sales Tax = 8% of invoice price
  - (c) Trade Discount 10% on invoice price
  - (d) Insurance = ₹ 1,000
  - (e) Delivery charges = ₹ 250
  - (f) Cost of containers: ₹600 per container; Each container holds 50 kg of material. When containers are returned within 6 weeks, rebate allowed is ₹400 per container. Containers are normally returned on time. There is no sales tax, discount, insurance or delivery charge applicable to the containers. Material X is supplied in containers. Container Costs are paid separately.
  - (g) Two containers were lost in transit. This is considered abnormal.
  - (h) One container of material was rejected after receipt, on inspection and discarded along with the material, (considered normal).
  - (i) Three containers were damaged in transit/loading/unloading before they reached the stores. No material was useable from these. This is a normal loss in every consignment of 24 containers.

Present a statement showing the itemwise treatment of the above, stating your remarks for each, in accordance with CAS for material cost and arrive at the final cost (₹/kg) of the material to be used to record the value of receipts in the stores ledger. 8

- (b) (i) PQ Ltd. has two production shops P and R manufacturing products 'PDT' and 'RS' respectively. Staff X, Y and Z work in shop P, staff R and S work in shop R and foreman F supervises shops P and R. 'A' is the accounts assistant in the Accounts Department who does the accounting and the payment.

Salesmen M and N market products PDT and RS respectively. The company pays the staff at certain specified rates for the hours worked. The following information is given:

Sl. No.	Details	X	Y	Z	R	S	F	A	M	N
I	Total hours worked as per time sheet	1440	1440	1340	1640	1640	1600	1000	600	600
II	Overtime hours included in I				50	50	50			
III	Night Shift hours (included in I above, in addition to II)	20	20	20	150	150	170			

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<b>IV</b>	<b>Normal wage rate per hour (₹/hr)</b>	40	40	40	40	40	100	80	65	75
<b>V</b>	<b>Overtime allowance ₹/hr (in addition to IV)</b>				20	20	30			
<b>VI</b>	<b>Night Shift Allowance ₹/hr (in addition to IV)</b>	30	30	30	30	30	45			
<b>VII</b>	<b>Idle time during the day due to sudden unexpected overhaul (hours included in I above)</b>	70	70	70	70	70	70			

**Additional Information:**

All the night shift and overtime done by X, Y, Z, R, S and F were done only in shop P due to power failure during the normal hours.

Salary of A will be in the ratio 5:3 for products PDT and RS respectively.

Present a statement showing the item-wise amounts that you would include under Direct Labour and appropriate overhead for each type of product. Comment on the treatment of the overhaul cost as per item VII above. 13

(ii) What are defectives? How would you treat them in Cost Accounts? 3

(c) (i) A manufacturing company buys its monthly requirement of 7500 units of material in 10 equal instalments every year. Purchase cost per unit is 15 and ordering cost is ₹ 450 per order. Inventory carrying cost is 15% p.a.

At what quantity of purchase will the ordering costs equal the inventory carrying costs? What is the total annual cost under the prevailing inventory policy?

If the supplier is willing to offer a discount of 3% on supplies more than 22,500 per order, what would you recommend as the revised order quantity? Evaluate by comparison with the option of ordering at economic order quantity. 3+2+3=8

(ii) The following information relates to the activities of production Dept. M of MTH Ltd. for Nov 2014:

Materials Consumed: ₹3,83,000; Direct labour: ₹5,74,000; Factory overhead chargeable to Dept. M: ₹ 2,75,760; Labour hours worked: 18,384 hours; Machine hours: 3064 hours;

One job order carried out in Dept. M has the following details:

Material Consumed: ₹ 11,000; Direct Labour Cost = ₹ 19,000; Direct labour hours: 540 hours;

Machine hours worked: 85 hours. Find the amount of factory overheads for the job under the following methods of overhead absorption: % of direct material cost, % of direct labour cost, % of prime cost, direct labour hour rate and machine hour rate. 8

(d) (i) A product passes through two processes, machining and finishing. Each is a cost centre. 1000 kgs of raw material (i.e. 100 pieces) are machined in a production period. 5% of the input in kgs is the normal machining loss in the form of machining waste, but 100 pieces come out of the process. There is a further loss of 4% in the Finishing process from the weight of each piece that was sent in. 10% of the number of pieces were finally scrapped and sold at ₹ 25 piece. Some of the expenses incurred are listed below:

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- (a) For every 100 pieces of input, the machining dept. uses a special cleaning material pack which is purchased at a base price of ₹10,000; VAT 14.5%. The additional cost of transporting it to the shop floor is ₹ 1,200 per pack.
- (b) There are two special computers used for designing specifications in the machine shop. A computer professional who is on a monthly salary of ₹ 30,000 attends to the repairs and maintenance of this machine and 19 other machines in the company. The company feels it is not economical to establish a procedure to time his work on various machines since log of computer down-time is not maintained.
- (c) The Finishing Department hires special equipment at ₹25,000 per production period.
- (d) Since the Finishing Dept. did not finish on time, 15,000 was payable to the customer as penalty.

Present a statement showing the direct expenses of each department—Machining and Finishing. What will be the components of direct expenses per piece and per kg of the final product relating to the given information? Present your answer in line with the disclosure requirement as per CAS 10. 8

- (ii) What is imputed cost? Give an example of imputed cost. Explain its position in a product cost sheet and in the decision making evaluation process. 4
- (d) (iii) A firm has purchased a plant to manufacture a new product. The cost data are given below:

Estimated annual sales	36,000 units
Material	₹ 4 per unit
Direct labour	₹ 0.6 per unit
Overheads - Manufacturing	₹ 24,000 p.a.
Administrative expenses	₹ 28,800 p.a.
Selling Expenses	15% of sales

Calculate the selling price if profit per unit is ₹ 1.50. Assume whatever is produced is sold. 4

### Answer: 2. (a)

- (i) Standard time = 10 minutes per piece = 6 units per hour.

X: Std time for 60 units = 10 hrs. Hrs saved = 2. Rowan's premium = 8hrs x 2 hrs/10 hrs x 30 ₹/hr = ₹48

$$\text{Wages} = 8 \times 30 + 48 = ₹288$$

$$Y: \text{Std time} = 12 \text{ hrs. Rowan's premium} = 8 \text{ hrs} \times 4/12 \times 30 = ₹80$$

$$\text{Wages} = 8 \times 30 + 80 = ₹320$$

$$\text{Piece rate X: } 60 \times 5 = ₹300; Y: 72 \times 5 = ₹360.$$

- (ii) Idle time cost:

Unavoidable idle time is usually for an insignificant period and is charged to the production order or standing order.

Normal idle time is booked to factory overhead.

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Abnormal idle time is for a significant period and is not charged to cost. It is adjusted through the Costing P and L A/c.

(iii)

<b>Details</b>	<b>Kg</b>	<b>Containers(nos)</b>	<b>Value (₹)</b>
Invoice Price ₹20/kg	1,200	24	1,200×20= 24,000
Less: Trade discount 10% on invoice price			2,400
Net Invoice Price			21,600
ADD: Sales Tax 8%			1,920
Insurance			1,000
Delivery Charges			250
Sub Total	1,200	24	24,770
Less: Normal Loss	150	3	-----
After Normal Loss	1,050	21	24,770
Abnormal Loss*	100	2	2,359
Net after abnormal loss	950	19	22,411
Normal Loss- Rejection	50	1	-----
Value absorbed by good quantity	900	18	22,411
Container Cost 200 ×18+ 600 × 4			6,000
Cost of material in stores ledger as per CAS	900	18	28,411
Cost per Kg (22,411 /900)			24.90
Cost per container (28,411 /18)			1,578.39

\*Abnormal loss to be charged to P & L A/c:

Material =	₹2,359
Container 2 × 600=	₹1,200
Total =	<u>₹3,559</u>

### Calculation of Abnormal Cost:

$$\text{Abnormal Cost} = 24,770 \times \frac{2}{21} = 2,359$$

(b) (i)

Cost Component	Product PDT		Product RS	
Direct Labour				
X	1370 X 40	54,800		
Y	1370 X 40	54,800		
Z	1270 x 40	50,800		
R	200 x 40	8,000	1370 x 40	54,800
S	200 x 40	8,000	1370 x 40	54,800
Sub total - worker hrs	4410		2740	
<b>Sub total - Direct Labour Cost</b>		<b>176400</b>		<b>109600</b>
Production Overhead				
Overtime Premium				
R	50x20	1000		
S	50x20	1000		

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F		50x30	1500		
Sub total - worker hours		100			
Sub total - overtime premium			3500		
Night Shift allowance					
X		20x30	600		
Y		20 x 30	600		
Z		20x30	600		
R		150x30	4500		
S		150 x 30	4500		
F		170x45	7650		
Sub total - worker hours		360			
Sub Total- Night Shift Allowance			18,450		
Foreman's Salary 1530 x100 = 153000		153000/(4870+2 740) x 4870	97912	153000/(4870+ 2740)x 2740	55088
Total Worker hours supervised by F		4410 + 100+360 = 4870		2740	
<b>Sub total - Production Overheads</b>			<b>119862</b>		<b>55088</b>
Abnormal Idle Time 70 hours x 5 persons x 40 ₹ = 14000; 70 hours of F x 100 ₹/hr = 7000; Charged to Costing P and L A/c to eliminate distortion					
<b>Administration Overheads</b>					
A:1000 x 80		5/8 x 8000	<b>5000</b>	3/8 x 8000	<b>3000</b>
Selling Overheads					
M		600 x 65	<b>39,000</b>		
N				600 x 75	<b>45,000</b>

(ii) Defectives are items produced in a manufacturing process, but are not up to the specifications of good output. They can be reworked or sold as seconds.

Rectification costs of normal defectives are treated as part of product or process cost if identifiable with a specific product or process. If not identifiable, they are treated as manufacturing overhead.

Abnormal defectives' rectification costs are charged to the profit and loss account.

(c)

(i) Ordering costs =  $450 \times 7500 \times 12 / q$ ; Carrying cost =  $q/2 \times 15 \times 15\%$

When ordering cost = carrying cost, we have EOQ;

$Q^2 = 450 \times 7500 \times 12 \times 2 / (15 \times 0.15) = 6000$  units.

For EOQ = 6000, ordering cost = carrying cost per annum.

**Current Policy:**

Purchase cost =  $7500 \times 12 \times 15 =$  **13,50,000**

Ordering cost =  $10 \times 450 =$  **4,500**

Carrying Cost =  $0.15 \times 7500 \times 12 / (2 \times 10) \times 15 =$  10,125 = **13,64,625.**

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At EOQ, ordering cost =  $7500 \times 12 / 6000 \times 450 = 6750$ ; Carrying cost = 6750; Purchase cost = 13,50,000

Total cost = 13,63,500

At 22,500 order qty,

Carrying cost =  $22500/2 \times 0.97 \times 15 \times 15 \% = 24553$ ; Ordering cost =  $7500 \times 12 / 22500 \times 450 = 1800$

Purchase cost =  $7500 \times 12 \times 0.97 \times 15 = 13,09,500$ .

Total Cost = 13,35,853.

It is better to take the discount.

(ii)

Parameters for overhead absorption	Total Cost for Dept	Departmental overhead as % of cost element	Job order Cost	Overhead to Job order at Dept %
Material	3,83,000	$275760/383000 = 72\%$	11000	<b>7920</b>
Direct Labour	5,74,000	$2,75,760 / 574500 = 48\%$	19000	<b>9120</b>
Prime Cost	9,57,500	$275760/957500 = 28.82\%$	30,000	<b>8646</b>
Machine Hours = 3064;				
Deptal m/c hr rate = $275760/3064 =$		<b>90 ₹/hr</b>		
M/c hour rate for job x m/c hrs for job = $85 \times 90 =$				<b>7650</b>
Direct labour hour rate for dept = $275760/18384 =$		<b>15 ₹/hr</b>		
Direct labour hour rate for job = $540 \times 15 =$				<b>8100</b>

(d) (i)

Calculation of Machining		
	Input Kg.	Value (₹)
	1,000 kg	10,000
Add: VAT	-----	1,450
Add: Transport Cost	-----	1,200
Less Normal loss 5%	50	
Total cost for 950 kg.	950	12,650
Cost per kg ( $12,650 / 950$ )		13.32

Calculation of Finishing		
	Input kg.	Value (₹)
	950	12,650
Add: Repair and maintenance Cost	-----	1,500
Add: Special Equipment	-----	25,000
Less: Normal loss 4%	38	
Total Cost for 912 kg.	912	39,150
Less: 10% scrapped	91.2	228
Total Cost for 820.8 kg.	820.8	38,922
Cost per unit ( $38,922 / 820.8$ )		47.42

Penalty- Financial Charges; Not a direct expenses; Not to be taken as any cost.

Direct expenses includes material or labour traceable into the cost unit, but not part of the

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output.

Cost of material includes purchase cost, taxes and transport inwards.

## 2. (d)

- (ii) Imputed costs are hypothetical or notional costs, not involving cash outlay, computed only for the purpose of decision making. CAS specifically provide for exclusion of imputed cost from the cost sheet in every form- material, labour and overhead. Imputed costs are like opportunity costs. E.g. interest on funds generated internally. When alternative capital investment proposals are evaluated, imputed cost of capital from internal funds is used for decision making.

## 2. (d)

(iii) Variable cost p.u. =  $4+0.6 = 4.6$

Profit = 15

Total = 6.1

$6.1 \times 36,000 + 24000 + 28800 = 0.85 \times s \times 36000$ .

Selling price per unit =  $s = 8.9019 = 8.90$

## 3. Answer any two questions:

16x2=32

- (a) (i) From the following details, find out the working capital requirements of G. Ltd. on cash cost basis:

Sales (at 3 months' credit)	₹ 60,00,000
Material Consumed (Suppliers extend 2 months' credit)	₹ 18,00,000
Wages paid (one month in arrear)	₹ 11,40,000
Cash Manufacturing expenses outstanding at the year end (cash expenses are paid one month in arrear)	₹ 90,000
Total Administrative expenses (paid as above)	₹ 4,20,000
Sales Promotion expenses (paid one month in advance)	₹ 2,70,000

It keeps two months' stock of raw materials, one month's stock of finished goods and a cash balance of ₹ 2,00,000. There is no work-in-progress. 8

- (ii) The following is the capital structure of P Ltd. as on 31st March, 2014:

6,00,000 equity shares at ₹ 10 each fully paid

10,000 9% preference shares of ₹ 100 each fully paid

30,000 12% debentures of ₹ 100 each

The equity share sells at ₹ 20 per share. The dividend expected next year is ₹ 2.5 per share, which is expected to grow at 5% per annum forever. Corporate tax rate is 30%.

- (a) Compute the weighted average cost of capital based on the existing capital structure.
- (b) If the company raises an additional debt of ₹25,00,000 by issuing 14% debentures, resulting in increasing the expectation on equity dividend to ₹ 2.70 per share and

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leaving the growth rate unchanged and the fall in equity share price to ₹ 18 per share, find the revised weighted average cost of capital. 8

- (b) (i) Lokesh Ltd. is considering buying a machine costing ₹15,00,000 which yields the following annual income:

End of year	1	2	3	4	5
Annual Income after Depreciation but before tax	3,50,000	3,72,000	3,10,000	1,75,000	1,10,000
P.V. factor at 12% of ₹1	0.893	0.797	0.712	0.636	0.567

Corporate tax rate applicable is 30%. Depreciation is on straight line basis for 5 years. There is no scrap value. Normal rate of return is 12%. Round off calculations to the nearest rupee and calculate:

- (a) Pay-back period  
(b) Discounted pay back period  
(c) Net Present Value  
(d) Profitability Index.

8

- (ii) What are the assumptions of the Modigliani-Miller theory on capital structure and the overall cost of capital? 8

- (c) (i) The following information is given to you:

Gross Profit	₹ 1,08,000
Shareholders' funds	₹ 6,00,000
Gross Profit Margin	25%
Ratio - Credit Sales to total sales	80%
Ratio - Total Turnover to Total Assets	0.3 times
Ratio-Closing Inventory to Total Sales	1/5 times
Average debtors	20 days
Current ratio	1.5
Ratio-Long Term Debt to equity	80%
(Use 360 days per year for calculations)	

Find the following:

- (a) Fixed Assets turnover ratio  
(b) Cash/Bank Balances  
(c) Current Liabilities  
(d) Closing Inventory  
(e) Debtors  
(f) Cash Sales

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- (c) (ii) Explain the concepts of operating and financial leverage and the EBIT-EPS indifference point. What financial plan would you opt for when EBIT is (i) above, (ii) at and (iii) below the indifference point? 8

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**Answer: 3. (a)**

(i) Computation of annual manufacturing cost and cash cost of sales

Particulars	Amount (₹)
Material Consumed	18,00,000
Wages	11,40,000
Manufacturing Expenses (90,000 x 12)	10,80,000
Total Cash Cost of Manufacture	40,20,000
Administrative expenses	4,20,000
Sales Promotion Expenses	2,70,000
<b>Total Cash Cost of Sales</b>	<b>47,10,000</b>

Statement of Working Capital Requirement:

Particulars	Amount (₹)
A. Current Assets:	
Stock of Raw Materials (18,00,000) x 2 / 12	3,00,000
Stock of Finished Goods (40,20,000)/12	3,35,000
Debtors (47,10,000) x 3/12	11,77,500
Prepaid Sales Promotion Expenses 2,70,000/12	22,500
Cash Balance	2,00,000
<b>Sub total Current Assets:</b>	<b>20,35,000</b>
B. Current Liabilities	
Creditors for materials (18,00,000)/6	3,00,000
Outstanding Wages (11,40,000)/12	95,000
Outstanding Manufacturing Expenses	90,000
Outstanding Administrative Expenses (4,20,000)/12	35,000
<b>Sub Total</b>	<b>5,20,000</b>
<b>Working Capital required = CA-CL =</b>	<b>15,15,000</b>

(ii) Computation of WACC

Source of funds	Amount (₹)	Weight	Cost of capital (after tax)	WACC
Equity Shares	60,00,000	0.6	0.175	0.105
9% Preference Shares	10,00,000	0.1	0.09	0.009
12% Debentures	30,00,000	0.3	0.084	0.0252
<b>Total</b>	<b>1,00,00,000</b>	<b>1.00</b>		<b>0.1392 or 13.92%</b>

**Working Notes:**

$$\begin{aligned}
 \text{(i) Cost of Equity Capital (Ke)} &= \frac{D}{mp} + g = \frac{2.5}{20} + .05 \\
 &= 0.125 + 0.05 = 0.175 \text{ or } 17.5\%
 \end{aligned}$$

$$\text{(ii) Cost of Preference Capital (Kp)} = 9\% \text{ or } 0.09$$

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(iii) Cost of 12% Debentures ( $K_d$ ) =  $r(1 - T)$   
 $= 0.12(1 - 0.3) = 0.084$  or 8.4%

(ii) Revised WACC

Source of Funds	Amount ₹	Weight	Cost of capital (after tax)	WACC
Equity Shares	60,00,000	0.48	0.20	0.09600
9% Preference Shares	10,00,000	0.08	0.09	0.00720
12% Debentures	30,00,000	0.24	0.084	0.02016
14% Debentures	25,00,000	0.20	0.098	0.01980
Total	1,25,00,000	1.00		0.14296 or 14.296%

### Working Notes:

(i) Revised cost of equity ( $K_e$ ) =  $\frac{D}{mp} + g = \frac{2.70}{18} + .05$   
 $= 0.15 + 0.05 = 0.20$  or 20%

(ii) ( $K_p$ ) = 0.09 or 9%

(iii) Cost of 12% Debentures = 0.084 or 8.4%

(iv) Cost of new 14% Debentures =  $r(1 - T) = 0.14(1 - 0.3)$   
 $= 0.098$

### 3. (b) (i)

Annual Depreciation =  $15,00,000/5 = ₹ 3,00,000$

Calculation of Annual Cash Inflows:

Year	Annual Income Before tax	Tax @ 30%	EAT	Cash Inflows [EAT + Depreciation (₹ 300000)]	Cumulative cash inflows
	(₹)	(₹)	(₹)	(₹)	(₹)
1	3,50,000	1,05,000	2,45,000	545000	545000
2	3,72,000	1,11,600	2,60,400	560400	1105400
3	3,10,000	93,000	2,17,000	517000	1622400
4	1,75,000	52,500	1,22,500	422500	2044900
5	1,10,000	33,000	77,000	377000	2421900

(i) Pay-back Period =  $2 + (1500000 - 1105400)/517000$   
 $= 2.763$  year or 2 years and 9.16 months

(ii) Discounted Pay-back Period :

Calculation of Present Values:

Year	Cash Inflows	P.V. factor @ 12%	P.V. of Cash Inflows	Cumulative Present Value
	(₹)	(₹)	(₹)	(₹)
1	5,45,000	0.893	4,86,685	4,86,685
2	5,60,400	0.797	4,46,639	9,33,324

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3	5,17,000	0.712	3,68,104	13,01,428
4	4,22,500	0.636	2,68,710	15,70,138
5	3,77,000	0.567	2,13,759	17,83,897

$$\begin{aligned}\text{Discounted pay-back period} &= 3 + (1500000 - 1301428)/268710 \\ &= 3.739 \text{ Years or } 3 \text{ Years and } 8.87 \text{ months}\end{aligned}$$

(iii) Net Present Value (NPV) = Total Present Value of Cash Inflows - Initial Investment  
= 17,83,897 - 15,00,000 = ₹2,83,897

(iv) Profitability Index = Total Present Value of Cash Inflows/Initial Investment  
= 1783897 / 1500000 = 1.18926

### 3. (b) (i)

The MM Hypothesis on capital structure is:

The overall cost of capital  $K_o$  and the value of the firm are independent of the capital structure. The total market value of the firm is given by capitalizing the net operating income by the rate appropriate for the risk class, i.e. as the debt increases, the advantage is exactly offset by the increase in cost of equity, thereby maintaining the same overall cost of capital.

#### Assumptions:

1. The market is a perfect capital market, i.e.

Investors are free to buy and sell securities

Individuals can borrow funds without restriction at the same terms as firms do.

Investors behave rationally and are well informed.

There are no transaction costs

2. Firms can be classified into homogeneous risk classes. All firms in the same risk class will have the same degree of financial risk.
3. All firms have the same expectation of a firm's net operating income.
4. The dividend payout ratio is 100 %, which means there is no retained earnings.
5. There is no corporate taxation. - This assumption has been removed later.

### 3. (c) (i)

Sales = 1,08,000 / 25 % = 4,32,000;

Credit sales = 80 % = 3,45,600

Cash Sales = **86,400**

Debtors = 20 days =  $20/360 \times 3,45,600 = 19,200$

Closing Inventory =  $1/5 \times \text{sales} = 1/5 \times 4,32,000 = 86,400$

Total Assets = sales/0.3 = 4,32,000/0.3 = 14,40,000.

Long term debt = 80 % of equity =  $0.8 \times 6,00,000 = 4,80,000$

Total Assets = 14,40,000.

Less: Equity + Long term debt: 10,80,000

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Balance = Current Liabilities **3,60,000**

Current ratio = 1.5. Hence Current assets =  $1.5 \times \text{current liabilities} = 1.5 \times 3,60,000$

Current assets = **5,40,000**

Less: Debtors 19,200

Less: Inventory 86,400

Balance = Cash/Bank **4.34,400**

Fixed Assets = total assets - current assets =  $14,40,000 - 5,40,000 = 9,00,000$

Turnover to fixed assets =  $4,32,000 / 9,00,000 = 0.48$

## 3. (c) (ii)

### Operating Leverage:

Operating leverage refers to the impact of change in sales on the level of operating profits of the firm. Other things remaining the same, higher the Degree of operating leverage (DOL), higher will be the change in EBIT (Earnings before interest and taxes) for the same change in the number of units sold. If firm A has higher DOL than firm B, then for the same increase in market demand, A will make a higher profit than B and vice versa. DOL is high when contribution is high.

DOL = Contribution / EBIT

Financial Leverage (FL) is the % increase in EPS for a given % level of increase in EBIT. The degree of financial leverage (DFL) = EBIT/ EBT. DFL measures the fixed financial charge against the operating profit of the firm. Other things remaining the same, higher the DFL, higher will be the change in EPS for the same level of change in EBIT.

Indifference point is the level at which the EPS remains the same irrespective of the debt-equity mix.

For EBIT below indifference point, option with lower debt should be preferred.

For EBIT above indifference point, option with higher debt is preferred.

For EBIT = indifference point, any option is the same since EPS is the same.