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TEST PAPER – 05

FINANCIAL MANAGEMENT & BUSINESS DATA ANALYTICS

Time Allowed: 3 Hours **Full Marks: 100**

Section A contains Question Number 1. All parts of this question are compulsory. Working notes should form part of the relevant answer.

SECTION-A

1. Choose the correct answer from the given alternatives (you may write only the Roman number and the alphabet chosen for your answer) (2×15 = 30 Marks)

(i) The Profitability Density function describes:
(A) The characteristics of a Random Variable
(B) The characteristics of a Non-Random Variable
(C) The characteristics of a Non-Random Constant
(D) The characteristics of a Random Constant.

(ii) Axis Ltd. follows Walter's view of dividend policy. Its earnings per share is ₹40 and face value of equity share is ₹100. It has a rate of return of 20% and capitalization rate is 8%. What should be the market price per share if payout ratio is zero?
(A) ₹500
(B) ₹1,000
(C) ₹1,250
(D) ₹1,500

(iii) A Co. pays a dividend of 20% on the equity shares of face value of ₹100 each. Find out the value of the equity share given that the dividend rate is expected to remain same and the required rate of return is 15%.
(A) ₹133.33
(B) ₹120
(C) ₹150
(D) ₹200

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(iv) According to AS-3 (Revised), interest received on investment is an element of cash flow from _____ activities.
(A) Investing
(B) Operating
(C) Financing
(D) Both operating and investing

(v) Debt Financing is a cheaper source of finance because of:
(A) Dividends not payable to lenders
(B) Tax-deductibility of Interest
(C) Rate of Interest
(D) Time Value of Money

(vi) P Ltd. issues 10,00,000, 12% debentures of ₹100 each at a premium of 20 per cent. The debentures are redeemable after the expiry of a fixed period of 10 years at 40 per cent premium. Calculate the cost of debt after tax if corporate tax rate is 30%.
(A) 8.50%
(B) 9%
(C) 8%
(D) 10%

(vii) Cost of Capital refers to:
(A) Required Rate of Return
(B) Floatation Cost
(C) Dividend
(D) None of the above

(viii) The capital structure of X Ltd. consists of 40% Equity Share Capital 40% Preference Capital and 20% Debt. The after-tax cost of the Preference Capital and Debt are 15% and 7.20% respectively. The weighted average cost is 15.44%. X Ltd. paid currently a dividend of ₹4 per share. The current market price of its equity share is ₹44. Find the growth rate.
(A) 11%
(B) 10%
(C) 9%
(D) 8%

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(ix) Capital Budgeting techniques which considers the time value of money is based on:
- **(A)** Last Dividend Paid
- **(B)** Interest Rate on Borrowings
- **(C)** Accounting Profit of the organization
- **(D)** Cash Flows of the organization

(x) The discount rate used for determining NPV of a project under capital budgeting is at least the _____.
- **(A)** Cost of Capital
- **(B)** Risk-free rate
- **(C)** Return on Equity
- **(D)** Cost of Debt

(xi) All permanent current assets are financed out of long-term sources of finance under _____ Approach of Working Capital Management.
- **(A)** Conservative
- **(B)** Matching
- **(C)** Moderate
- **(D)** Aggressive

(xii) A firm has a capital of ₹10 lakhs, sales of ₹5 lakhs, gross profit of ₹2 lakhs and expenses of ₹1 lakh. The Net Profit Ratio is:
- **(A)** 10%
- **(B)** 20%
- **(C)** 40%
- **(D)** 50%

(xiii) The excess of Current Assets over Current Liabilities is called:
- **(A)** Working Capital
- **(B)** Net Current Assets
- **(C)** Net Working Capital
- **(D)** All of the above

(xiv) Which of the following is not considered while preparing cash budget?
- **(A)** Conservation Principle
- **(B)** Accrual Principal
- **(C)** Difference in Capital and Revenue items
- **(D)** All of the above

(xv) Data may be classified as Restricted _____ or Public by an entity.
- **(A)** Sensitive
- **(B)** Internal
- **(C)** Private
- **(D)** Confidential

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SECTION-B

2. (a) The Following information is available for SORTEX LTD.

Installed capacity	4,000 units
Actual production and sales	75% of the capacity
Selling price	₹30 per unit
Variable Cost	₹15 per unit
Fixed Cost:	
Under situation I	₹15,000
Under situation II	₹20,000
Tax rate	40%

Capital Structure	Financial Plan	
	A	B
Equity	10,000	15,000
Debt	10,000	5,000
Cost of Debt	20%	20%

Required:

Calculate the degree of Operating Leverage (DOL), Degree of Financial Leverage (DFL) and Degree of Combined Leverage (DCL). Under situation I and situation II and Financial Plans A and B. **(7 Marks)**

2. (b) Given below is the Statement of Assets and Liabilities of a company as at 31st December, 2016:

Liabilities	₹	Assets	₹
Equity Share Capital:		Fixed Assets	6,00,000
40,000 shares of ₹10 each	4,00,000	Investments	1,00,000
Reserves & Surplus	2,60,000	Current Assets	2,80,000
8% Debentures	1,70,000		
Current Liabilities:			
Short term loans	1,00,000		
Trade creditors	50,000		
	9,80,000		9,80,000

Calculate the company's weighed average cost of capital using balance sheet valuations. The following additional information are also available.

(i) 8% Debentures were issued at par.

(ii) All interest payments are up to date and equity dividend is currently 12%.

(iii) Short-term loan carries interest at 18% p.a.

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(iv) The shares and debentures of the company are quoted on the Calcutta Stock Exchange and current Market Prices are as follows:
Equity Shares at ₹14 each and 8% Debentures at ₹98 each.

(v) The rate of tax for the company may be taken at 50%. **(7 Marks)**

3. (a) Nona Ltd. provides you with the following information:

Particulars	Machine X	Machine Y
1. Purchase Price of Machine	₹6,00,000	₹10,00,000
2. Working Capital	₹3,00,000	₹5,00,000
3. Useful Life of the machine	5 years	8 years
4. Estimated Salvage Value at the end of useful life	₹1,00,000	₹2,00,000
5. Actual Salvage Value realised at the end of useful life	₹1,20,000	₹80,000
6. Method of Depreciation	Straight line	Straight line
7. Tax Rate	30%	30%
8. Annual Earning before Tax	₹4,00,000	₹4,00,000
9. Annuity Factor for 5/8 years @10%	3.791	5.335
10. PV Factor for $5^{th}/8^{th}$ year @10%	0.621	0.467

Required: Which of the above machines should be purchased? **(7 Marks)**

3. (b) ALC Ltd. provides you with the following information:
Estimated Level of Activity: Completed Units of Production 1,04,000 plus units of WIP.

Raw material	19.6% of the selling price
Wages	10.6% of the selling price
Production Overheads (including depreciation of ₹15 per unit at the budgeted level of activity)	17.6% of the selling price
Selling Price	₹500 per unit
Average raw material in stock	3 weeks
Average work-in-progress (% of completion with respect to Material-75%, Conversion Cost-70%)	2 weeks
Finished goods in stock	4 weeks
Credit allowed to debtors	2½ weeks
Credit allowed by creditors	3½ weeks
Time lag in payments of labour	2 weeks
Time lag in payments of Production Overheads	1½ weeks
Cash Sales and Cash Purchases	25%
The company believes in keeping ₹3,00,000 available to it including the overdraft limit of ₹75,000 not yet utilized by the company.	

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Provision for contingencies is required @4% of the working capital requirement including that provision.
Assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly.

You are required to calculate the Net Working Capital Requirement on Cash Cost Basis if ALC Ltd. is a newly formed company. **(7 Marks)**

4. (a) SHELLICOLA (IND) LTD. has furnished the following information for the year ended 31st March, 2019

	(₹ in Lakhs)
Net profit	35,500
Dividend (including interim dividend paid)	10,000
Provision for Income Tax	7,500
Income Tax paid during the year	6,300
Loss on sale of assets (net)	60
Book value of assets sold	250
Depreciation charged to P&L Account	30,000
Profit on Sale of investments	150
Value of investments sold	40,650
Interest expenses (due during the year)	15,000
Interest paid during the year	15,780
Increase in working capital (excluding cash and bank balance)	84,100
Purchase of fixed assets	
Opening cash and bank balance	840
Closing cash and bank balance	1,032
	12,912

You are required to prepare the cash flow statement in accordance with AS 3 (Revised) ended March 31st, 2019. **(7 Marks)**

4. (b) The WONDERLAND LTD. has the following Book Value Capital Structure as on March 31, 2019.

	(Amount in ₹ Thousand)
6,00,000 Equity Share at ₹10 each fully paid	6,000
10,000, 9% Preference Shares of ₹100 each	1,000
30,000, 12% Debentures of ₹100 each	3,000
	10,000

The equity share of the Company sells at ₹20 per share. The dividend expected next year is ₹2.5 per share, which is expected to grow at 5% per annum. Corporate tax rate is 30%. You are required to determine the Weighted Average Cost of Capital (WACC) of Wonderland Ltd. based on the existing Capital Structure. **(7 Marks)**

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5. (a) Fill in the missing information in the following Comparative Statement of Profit or Loss.

S. No.	Particulars	2022-23 (₹)	2023-24 (₹)	Absolute Change (₹)	% change (₹)
	Revenue from operation Add: Other Income Total Revenue (I + II)	25,000		65,000	
	Expenses: a. COGS b. Other Expenses Total Expenses Profit before tax (III – IV) Less: Income Tax (30%) Profit After Tax	 25,000 60,000	 6,00,000 75,000	 2,00,000 	 60%

(7 Marks)

5. (b) Mritunjay Ltd. requires 90,000 units of a certain item annually. The cost per unit is ₹3, the cost per purchase order ₹300 and the inventory carrying cost ₹6 per unit per year. What is the Economic Order Quantity? Examine what will be Mritunjay Ltd.'s decision regarding the optimal quantity if the supplier, Anjali Ltd., offers discount as below:
For Order Quantity 4500-5999 units, discount is 2%; and For Order Quantity 6000 units and above, discount is 3%. **(7 Marks)**

6. (a) Jai & Karti Ltd. sells 10,00,000 bottles of Soda in a year. Each bottle produced has a variable cost of ₹5 and sells for ₹10. Fixed operating costs are ₹10,00,000. The company has debt of ₹12,00,000 at 10% rate of interest. As a Cost and Management Accountant you are required to calculate:
(i) The Degree of Operating Leverage,
(ii) The Degree of Financial Leverage, and
(iii) The Degree of Total Leverage. **(7 Marks)**

6. (b) Tulsian Ltd., is considering changing its credit terms from 1/35, net 60 to 2/10, net 60. As a result, the credit sales will increase from ₹150 crores to 105%, the Average collection period will decline by 25 days and the Default Percentage will increase from 0.5% to 1% Collection Expenses will increase from ₹35,000 to ₹40,500. At present, Selling Price is ₹300 per unit, Contribution to Sales Ratio 20%, Average Cost is ₹270 per unit and 60% of the credit customers avail cash discount. Should the credit terms be changed if the required rate of return is 24% (pre-tax) and the Tax rate is 25%?
(Take 360 days in a year.) **(7 Marks)**

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7. (a) ZENITH LTD. is faced with the problem of choosing between two mutually exclusive projects A and B. Project A requires a cash outlay of ₹10,00,000 and cash running expenses of ₹3,50,000 per year. On the other hand, Project B will cost ₹15,00,000 and require cash running expenses of ₹2,00,000 per year. Both the projects have an eight-year life. Project A has a salvage value of ₹40,000 and Project B has a salvage value of ₹1,40,000. The company's tax rate is 50% and it has a 10% required rate of return.

Required:

Assuming depreciation on straight line basis and that there is no funds constraint for the company, ascertain which project should be accepted.

[Given: PVIFA (10%, 8 years) = 5.335 and PVIF (10%, 8 years) = 0.467]

Note: Solve the problem by an incremental cash flow approach. **(7 Marks)**

7. (b) MN Ltd. wishes to evaluate two mutually exclusive proposals to acquire a machine. Machines M and N are being considered, each costing ₹2,00,000 and having an estimated life of 5 years and 4 years respectively. Both have nil salvage value. The anticipated cash inflows after adjustment of taxes for M and N are given below:

End of Year	**Machine M**	**Machine N**
1	70,000	1,00,000
2	60,000	90,000
3	60,000	80,000
4	50,000	40,000
5	90,000	Nil

Find the accounting rate of return and net present value for both the machines and advise MN Ltd. which machine should be bought. The required rate of return is 10% p.a.

Present Value factor for 10%

End of Year	1	2	3	4	5
	0.909	0.826	0.751	0.683	0.621

(7 Marks)

8. (a) 'Transformation of Data to Decision Relevant Information requires to go through certain core steps.' - In the light of the given statement, explain the steps to transform data into information. **(7 Marks)**

8. (b) 'Data Analytics is the science of evaluating unprocessed data sets to get some conclusions.' In the context of the given statement, briefly explain the steps of Data Analytics. **(7 Marks)**

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ANSWERS OF TEST PAPER – 05
FINANCIAL MANAGEMENT & BUSINESS DATA ANALYTICS

SECTION-A

ANS.1

(i) (A) The characteristics of a Random Variable

(ii) (C) ₹1,250

(iii) (A) ₹133.33

(iv) (A) Investing

(v) (B) Tax-deductibility of Interest

(vi) (C) 8%

(vii) (A) Required Rate of Return

(viii) (B) 10%

(ix) (D) Cash Flows of the organization

(x) (A) Cost of Capital

(xi) (D) Aggressive

(xii) (B) 20%

(xiii) (D) All of the above

(xiv) (D) All of the above

(xv) (D) Confidential

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SECTION-B

ANS. 2 (a)

	Situation I		Situation II	
	Financial Plan A	**Financial Plan B**	**Financial Plan A**	**Financial Plan B**
Sales (3,000 × 30)	90,000	90,000	90,000	90,000
Variable Cost (15 × 3,000)	(45,000)	(45,000)	(45,000)	(45,000)
Contribution	**45,000**	**45,000**	**45,000**	**45,000**
Fixed Cost	(15,000)	(15,000)	(20,000)	(20,000)
EBIT	**30,000**	**30,000**	**25,000**	**25,000**
Interest	(2,000)	(1,000)	(2,000)	(1,000)
EBT	**28,000**	**29,000**	**23,000**	**24,000**
Degree of Operating Leverage = Contribution/EBIT	1.50	1.50	1.80	1.80
Degree of Financial Leverage = EBIT/EBT	1.07	1.03	1.09	1.04
Degree of Combined Leverage = Contribution/EBT	1.61	1.55	1.96	1.87

ANS. 2 (b)

Calculation of the Cost of Equity:

	₹
Equity Share	4,00,000
Reserves and Surplus	2,60,000
Equity (Shareholder's) Fund	6,60,000

Book Value Per Share = 6,60,000/40,000 = ₹16.50
Equity Dividend Per Share = 12/100 × 10 = ₹1.20
Therefore, Cost of Equity (%) = 1.20/16.50 × 100 = **7.273%**

Cost of Debt:
Kd = 8(1 - 0.50) = **4%**

Computation of Weighted Average Cost of Capital:

Sources of Capital	₹	Weight	Cost of Capital (%)	Weighted Cost (%)
Equity	6,60,000	0.7952	7.273	5.7835
Debt	1,70,000	0.2048	4.000	0.8192
Total	**8,30,000**	**1.000**		**6.6027**

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ANS. 3 (a)

Particulars	Machine X (₹)	Machine Y (₹)
Annual Profit before tax	4,00,000	4,00,000
Less: Tax	(1,20,000)	(1,20,000)
Annual Profit After Tax	2,80,000	2,80,000
Add: Depreciation	1,00,000	1,00,000
Annual Cashflow	3,80,000	3,80,000
PVIFA @10%	3.791	5.335
Discounted Annual Cash inflow	14,40,580	20,27,300
Add: Present Value of cashflow from Salvage and Working Capital [4,14,000 × 0.621], [6,16,000 × 0.467]	2,57,094	2,87,672
Total Discounted Cashflow	16,97,674	23,14,972
Less: Initial Outflow	(9,00,000)	(15,00,000)
NPV	7,97,674	8,14,972
Equivalent annual NPV = NPV/PVIFA	**2,10,413**	**1,52,760**

Working Notes:

(1) Depreciation:

Machine X = (6,00,000 – 1,00,000)/5 = ₹1,00,000

Machine Y = (10,00,000 – 2,00,000)/8 = ₹1,00,000

(2) Cash Flow from Salvage value:

Machine X:

Gain = 1,20,000 – 1,00,000 = ₹20,000

Tax on Gain = 20,000 × 30% = ₹6,000

Net Inflow = 1,20,000 – 6,000 = **₹1,14,000**

Machine Y:

Loss = 2,00,000 – 80,000 = ₹1,20,000

Tax Savings = 1,20,000 × 30% = ₹36,000

Net Inflow = 36,000 + 80,000 = **₹1,16,000**

Advice: Machine X should be purchased as it gives higher equivalent annual net present value.

Note: Since life of proposals are not same, decision should be based on equivalent annual NPV instead of NPV.

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ANS. 3 (b)

Statement of Determination of Working Capital

Particulars		Amount (₹)
Current Assets:		
Raw Material Inventory	98 × 1,04,000 × 3/52	5,88,000
WIP Inventory	[(98 × 75%) + (53 × 70%) + (73 × 70%)] × 1,04,000 × 2/52	6,46,800
Finished Goods Inventory	224 × 1,04,000 × 4/52	17,92,000
Sundry Debtors (on Cost)	1,04,000 × 224 × 75% × 2.5/52	8,40,000
Cash	(3,00,000 – 75,000)	2,25,000
Total Current Assets		**40,91,800**
Liabilities:		
Creditors	98 × 1,10,000 × 75% × 3.5/52	5,44,183
Outstanding wages	53 × 1,04,000 × 2/52	2,12,000
Outstanding Production Overheads	88 × 1,04,000 × 1.5/52	2,64,000
Total Current Liabilities		**10,20,183**
Working Capital		**30,71,617**
Contingencies Provision	(30,71,617 × 4/96)	**1,27,984**
Total Working Capital Requirement		**31,99,601**

Working Notes:

	₹
Selling price per unit	500
Raw material 19.6% of 500	98
Wages 10.6% of 500	53
Production Overheads 17.6% of 500	88
Total Cost	**239**

Cash Cost = 239 – 15 = **₹224**

Purchases = 1,04,000 + (1,04,000 × 3/52) = 1,10,000 units.

(Since this is the first year there is no opening stock)

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ANS. 4 (a)

Cash Flow Statement for the year ended 31st March, 2019

Particulars	₹ in Lakhs	₹ in Lakhs
(A) Cash flow from Opening Activities:		
Net profit		35,500
Depreciation	30,000	
Provision for tax	7,500	
Loss on sale of assets	60	
Profit on sale of investments	(150)	
Interest Expense	15,000	52,410
Operating profit before working capital changes		**87,910**
Increase in working Capital		(84,100)
Tax paid		(6,300)
Net Cash flow from Operating activities		**(2,490)**
(B) Cash flow from Investing Activities:		
Sale of Assets (250 – 60)	190	
Sale of Investment (40,650 + 150)	40,800	
Purchase of Fixed Assets	(840)	
Net Cash flow from Investing activities		**40,150**
(C) Cash flow from Financing Activities:		
Interest paid	(15,780)	
Dividend paid	(10,000)	
Net Cash flow from Financing activities		**(25,780)**
Net increase in cash and cash equivalents		**11,880**
Cash and cash equivalents at the beginning		1,032
Cash and cash equivalents at the end		**12,912**

ANS. 4 (b)

Ke = (D1/P0) + g = 2.5/20 + 0.05 = 0.175 = **17.5%**
Kp = **9%**
Kd = 12(1 – 0.30) = **8.4%**

Calculation of Weighted Average Cost of Capital: (₹ in thousand)

Sources of Capital	Amount	Weight	Cost of Capital (%)	Weighted Cost (%)
Equity Share Capital	6,000	0.60	17.50	10.50
9% Preference Share Capital	1,000	0.10	9	0.90
12% Debentures	3,000	0.30	8.40	2.52
Total	**10,000**	**1.000**		**13.92**

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ANS. 5 (a)

Comparative Statement of Profit or Loss

S. No.	Particulars	2022-23 (₹)	2023-24 (₹)	Absolute Change (₹)	% change (₹)
I.	Revenue from operation	6,00,000	8,00,000	2,00,000	33.33%
II.	Add: Other Income	25,000	90,000	65,000	260%
III.	Total Revenue (I + II)	6,25,000	8,90,000	2,65,000	42.4%
IV.	Expenses:				
	a. COGS	4,00,000	6,00,000	2,00,000	50%
	b. Other Expenses	25,000	40,000	15,000	60%
	Total Expenses	4,25,000	6,40,000	2,15,000	50.59%
V.	Profit before tax (III – IV)	2,00,000	2,50,000	50,000	25%
	Less: Income Tax (30%)	60,000	75,000	15,000	25%
VI.	Profit After Tax	1,40,000	1,75,000	35,000	25%

ANS. 5 (b)

$EOQ = (2AQ/C)^{1/2}$

$EOQ = (2 \times 90{,}000 \times 300/6)^{1/2}$

$EOQ = 3{,}000$ units

Statement showing computation of total inventory cost at different order size

Particulars	Ordering Quantities		
	3,000	**4,500**	**6,000**
Purchasing Cost (A)	2,70,000 (90,000 × 3)	2,64,600 (90,000 × 2.94)	2,61,900 (90,000 × 2.91)
No. of orders (90,000/ordering quantity)	30	20	15
Ordering cost (No. of order × ₹300) (B)	9,000	6,000	4,500
Average Inventory (Ordering Quantity × 1/2)	1,500	2,250	3,000
Carrying cost per unit (₹)	6	6	6
Total Carrying cost (Average Inventory × carrying cost per unit) (C)	9,000	13,500	18,000
Total Cost (A + B + C)	**2,88,000**	**2,84,100**	**2,84,400**

For the above computations the best quantity to order is 4,500 – 5,999 units.

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ANS. 6 (a)

Contribution = ₹5 × 10 lakh bottles = ₹50,00,000
EBIT = ₹40,00,000 (50,00,000 – 10,00,000)
Interest = ₹1,20,000
EBT = (40,00,000 – 1,20,000) = ₹38,80,000
(i) Degree of Operating Leverage = Contribution/EBIT = 50,00,000/40,00,000 = **1.25**
(ii) Degree of Financial Leverage = EBIT/EBT = 40,00,000/38,80,000 = **1.03**
(iii) Degree of Total Leverage = DOL × DFL = 1.25 × 10.3 = **1.29**

ANS. 6 (b)

Working Notes:

1. **Calculation of Average Collection Period:**
   Present Policy = 35 × 0.60 + 60 × 0.40 = **45 Days**
   In proposed policy collection period will decline by 25 days. Hence, collection period will be = 45 – 25 = **20 days**

2. **Calculation of % of customer availing discount in Proposed Policy:**
   Average Collection period = 20 days
   Let, Proportion of customers availing discount be x.
   Therefore,
   Average collection period = 10x + 60(1 – x)
   20 = 10x + 60 – 60x
   50x = 40
   x = 0.80 = **80%**

3. **Calculation of Fixed Cost:**
   Variable cost per unit = 300 × 80% = 240
   Average cost per unit = 270
   Fixed cost per unit = 270 – 240 = ₹30
   Units = 150/300 = 0.50 cr.
   Total Fixed Cost = 0.50 × 30 = **₹15 Cr.**

4. **Opportunity Cost of Investment in Receivables (After Tax):**
   Present Policy = 135 × (45/360) × 24% × (1 – 0.25) = **₹3.0375 cr.**
   Proposed Policy = 141 × (20/360) × 24% × (1 – 0.25) = **₹1.41 cr.**

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Statement showing Evaluation of Credit Policies (₹ in Crores)

Particulars	Present Policy	Proposed Policy
Credit Sales	150	157.50
Less: Variable Cost @80%	(120)	(126)
Contribution	30	31.50
Fixed Cost	(15)	(15)
Bad debts 0.5% and 1%	(0.75)	(1.575)
Cash Discount [150 × 60% × 1%] [157.50 × 80% × 2%]	(0.90)	(2.52)
Collection Expenses	(0.0035)	(0.0041)
Profit before Tax	13.3465	12.4009
Tax at 30%	(3.3366)	(3.1002)
Profit after Tax	10.0099	9.3007
Cost of investment in Receivable	(3.0375)	(1.41)
Net Profit	**6.9724**	**7.8907**

Advise: Proposed policy should be adopted since the net benefit is increased by (₹7.8907 - ₹6.9724) = **₹0.9183 Crores.**

ANS. 7 (a)

Cash Outflows:

Particulars	Amount (₹)
Cost of Proposal B	15,00,000
Less: Cost of Proposal A	(10,00,000)
Incremental Cash outflows	**5,00,000**

Cash Inflows (Annual Savings):

Particulars	Amount (₹)
Savings in Cash running Expenses [3,50,000 – 2,00,000]	1,50,000
Less: Incremental Depreciation [1,70,000 = 1,20,000]	(50,000)
Profit Before Tax	1,00,000
Tax at 50%	(50,000)
Profit after Tax	50,000
Add: Depreciation	50,000
Annual Cashflow	1,00,000
PVIFA at 15%	5.335
Discounted Cash Inflows	5,33,500
Discounted Present Value of Incremental Salvage Value (1,00,000 × 0.467)	46,700
Total Discounted Cash Inflows	5,80,200
Incremental Cash Outflows	(5,00,000)
NPV	**80,200**

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Recommendation:
Since Project B has positive NPV over and above the NPV of Project A, Project B is recommended for acceptance.

Working Note for depreciation:
Project A: ₹(10,00,000 – 40,000)/8 years = ₹1,20,000
Project B: ₹(15,00,00 – 1,40,000)/8 years = ₹1,70,000

ANS. 7 (b)

(i) Calculation of Net Present value:

Year	Cash Inflows		PVIF @10%	Discounted Cash Inflows	
	M (₹)	N (₹)		M (₹)	N (₹)
1	70,000	1,00,000	0.909	63,630	90,900
2	60,000	90,000	0.826	49,560	74,340
3	60,000	80,000	0.751	45,060	60,080
4	50,000	40,000	0.683	34,150	27,320
5	90,000		0.621	55,890	-
Total	**3,30,000**	**3,10,000**		**2,48,290**	**2,52,640**
Less: Initial Outflow				(2,00,000)	(2,00,000)
NPV				48,290	52,640
PVIFA				3.169	3.79
Equivalent Annual NPV =NPV/PVIFA				**15,238**	**13,889**

Decision: Machine M should be selected as it has higher equivalent annual NPV
Note: Since life of proposals are not same, decision should be based on equivalent annual NPV instead of NPV.

(ii) Calculation of ARR:

Average Rate of Return: Average Profit/ Average Investment × 100
Note: [For evaluation of ARR the average investment has been taken at half of the initial cost for all the two machines]
Average Profit = Average Cash flow - Depreciation
M = [3,30,000/5] - 40,000 = ₹66,000 - 40,000 = ₹26,000
N = [3,10,000/4] - 50,000 = ₹77,500 - 50,000 = ₹27,500
Average rate of Return:
M = 26,000 × 100/1,00,000 = **26%**
N = 27,500 × 100/1,00,000 = **27.50%**
Decision: Machine N should be selected as it has higher ARR.

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ANS. 8 (a)

The emergence of big data has changed the world of business like never before. The most important shift has happened in the information generation and the decision-making process. There is a strong emergence of analytics that supports a more intensive data-centric and data-driven information generation and decision- making process. The data that encompasses the organization is being harnessed into information.

To make the data turn into user friendly information, it should go through six core steps:

- **Collection of data:** The collection of data may be done with standardized systems in place. Appropriate software and hardware may be used for this purpose. Appointment of trained staff also plays an important role in collecting accurate and relevant data.

- **Organising the data:** The raw data needs to be organized in an appropriate manner to generate relevant information. The data may be grouped, arranged in a manner that create useful information for the target user groups.

- **Data processing:** At this step, data needs to be cleaned to remove the unnecessary elements. If any data point is missing or not available, that also need to be addressed. The options available for presentation format for the data also need to be decided.

- **Integration of data:** Data integration is the process of combining data from various sources into a single, unified form. This step includes creation of data network sources, a master server and users accessing the data from master server.

- **Data reporting:** Data reporting stage involves translating the data into a consumable format to make it accessible by the users. For example, for a business firm, they should be able to provide summarized financial information e.g., revenue, net profit etc.

- **Data utilization:** At this ultimate step, data is being utilized to back corporate activities and enhance operational efficiencies and productivity for the growth of business. This makes corporate decision making really 'data driven'.

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ANS. 8 (b)

Data analytics is the science of evaluating unprocessed datasets to draw conclusions about the information they contain. It helps us to identify patterns in the raw data and extract useful information from them. Applications containing machine learning algorithms, simulation, and automated systems may be utilized by data analytics procedures and methodologies.

Steps of data analytics

Following are the steps for data analytics:

- **Criteria for grouping data:** Data may be segmented by a variety of parameters, including age, population, income, and sex. The data values might be either numeric or category.

- **Collecting the data:** Data maybe gathered from several sources, including internet sources, computers, personnel, and community.

- **Organizing the data:** After collecting the data, it must be arranged so that it can be analyzed. Statistical data can be organised on a spread sheet or other programme capable of handling statistical data.

- **Cleaning the data:** The data is initially cleansed to verify that there are no duplicates or errors. The document is then examined to ensure that it is comprehensive. Before data is sent to a data analyst for analysis, it is beneficial to rectify or eliminate any errors by cleaning the data.

- **Adopt the right type of data analytics approach** like Descriptive analytics, Diagnostics analytics, Predictive analytics & Prescriptive analytics which helps the company in streaming their processes, conserving resources and increasing their profitability.

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