

FREE OF COST

I.S.B.N : 81-7666-360-3

SCANNER'S APPENDIX

ICWA Stage - II

December 2005

Paper - 9

Management Accounting Performance Management

Chapter - 1 : Performance Management Systems

2005 - Dec [8] Write short notes on the following:

- (a) Important features of a Performance Measurement System; (4 marks)

Chapter - 2 : Marginal Costing

2005 - Dec [5] (c) Brilliant Ltd. is engaged in production of certain products, 100% capacity being 10,000 units per month. Given below are the information for the just concluded previous two months:

	Month 1	Month 2
Units Produced	6,000	9,000
Costs (other than direct material and labour)		
	Rs.	Rs.
Salaries	30,000	30,000
Power	30,000	39,000
Consumable Stores	30,000	45,000
Repair	40,000	46,000
Indirect Shop Labour	15,000	22,500
Depreciation	25,000	25,000
Inspection	10,000	13,000

Rate of production per hour is 10 units, Direct material costs Rs. 20 per unit and direct labour hour costs per hour are Rs. 80. You are required to compute cost of production segregating fixed, semi-variable and variable costs separately at 100%, 80% and 50% capacity utilisation levels respectively. Also work out the overhead absorption rate per hour at 100% capacity utilisation level. (Show your workings as part of the answer.) (8 marks)

Chapter - 3 : CVP Analysis

2005 - Dec [6] (b) ZED Ltd. produces two products, P and Q. The budgeted selling price per unit for P and Q are 3,600 and Rs. 4,320 respectively. Variable costs of production and sale for P and Q are Rs. 1,800 and Rs. 3,600 respectively. Annual fixed cost of the company amounts to Rs.1,76,000. The company has two different production/sales options as under:

Option 1— A mix of 2 units of P for every 3 units of Q

Option 2— A mix of 1 unit of P for every 2 units of Q

Find out the combined Break Even Point under each option and the optimal mix that the company should adopt. (10 marks)

2005 - Dec [8] Write short notes on the following:

(d) Cost Volume Profit Analysis; (4 marks)

Chapter - 4 : Linear Programming

2005 - Dec [7] (a) For a company engaged in the manufacture of three products A, B and C, the available data is given below:

Table — 1

Product	Minimum sales requirement per month
A	20
B	40
C	60

Table — 2

Operations	Hrs. required per item of			Total available hours per month
	A	B	C	
1	2	4	4	800
2	4	2	2	880
3	6	2	4	720

Table — 3

Product	Profit per unit (Rs.)
A	20
B	30
C	16

To find out the product mix and to maximize profit, formulate the problem as a Linear Programming model. (10 marks)

Chapter - 6 : Queuing Theory

2005 - Dec [4] Viswakarma Enterprises conducted a study for its maintenance shop and found that the inter arrival times at tool crib are exponential with an average time of 10 minutes. The length of the service time (amount of the time taken by the tool-crib operator to meet the needs of the maintenance man) is assumed to be exponentially distributed, with mean 6 minutes. Find:

- The probability that a person arriving at the booth of the shop will have to wait. (4 marks)
- Average length of the queue that forms and the average time that an operator spends in the queue system. (4 marks)
- The manager of the shop will instal a second booth when an arrival would have to wait 10 minutes or more for the service. By how much must the rate of arrival be increased in order to justify a second booth? (4 marks)

- (iv) Estimate the fraction of the day that tool crib operator will be idle. (2 marks)
- (v) The probability that there will be six or more operators waiting for the service. (2 marks)

Chapter - 8 : Budgetary Control

2005 - Dec [5] (a) Explain what is a Flexible Budget and state how this budget is useful to management. (5 marks)

(b) What is known as the Principal Budget Factor? (3 marks)

2005 - Dec [6] (a) What is Responsibility Centre? Briefly differentiate cost, profit and investment centres identifying the basic characteristics of each. (6 marks)

2005 - Dec [8] Write short notes on the following:

(b) Zero Based Budgeting; (4 marks)

Chapter - 9 : Transfer Pricing

2005 - Dec [3] (a) Why do transfer-pricing systems exist? (3 marks)

(b) Identify the relative advantages and disadvantages of basing transfer-pricing on total costs, variable costs, and market prices. (9 marks)

(c) Identify the factors affecting multinational transfer-prices. (4 marks)

Chapter - 10 : Standard Costing

2005 - Dec [8] Write short notes on the following:

(c) Behavioural consideration in Standard costing; (4 marks)

Chapter - 11 : Resource Allocation

2005 - Dec [2] Astha Insurance Ltd. processes a variety of insurance claims for losses, accidents, thefts, and so on. Account analysis has estimated the variable cost of processing each claim at 0.5% (.005) of the Rupee value of the claim. This estimate seemed reasonable because higher claims often involve more analysis before settlement. To control processing costs better, however, Astha Insurance conducted an activity analysis of claims processing. The analysis suggested that more appropriate cost drivers and behaviour for automobile accident claims are:

- 0.2% of Astha Insurance policyholders' property claims
- + 0.6% of other parties' property claims
- + 0.8% of total personal injury claims

Data from two recent automobile accident claims are as under:

	Automobile Claim No. A/893405	Automobile Claim No. A/578341
Policyholder Claim	Rs. 4,500	Rs. 23,600
Other Party Claim	0	Rs. 3,400
Personal Injury Claim	Rs. 12,400	0
Total Claim Amount	Rs. 16,900	Rs. 27,000

Required:

- (i) Estimate the cost of processing each claim using data from account analysis and then the activity analysis. (10 marks)

- (ii) How would you recommend that Astha Insurance estimate the cost of processing claims? (6 marks)

2005 - Dec [7] (b) What are the benefits to an organization on implementation of an ERP system? (6 marks)

2005 - Dec [8] Write short notes on the following:

- (e) Material Requirement Planning. (4 marks)

Chapter - 12 : Objective Questions

2005 - Dec [1] {C} (a) Match the following by choosing the correct statement from column II for each expression under column I:

<i>Column I</i>	<i>Column II</i>
(i) Measure of Profitability	(a) Evaluation of alternative investment opportunities
(ii) Angle of incidence	(b) Considers goal congruence
(iii) P/V graph	(c) Return on capital employed
(iv) Simulation	(d) Profit path of product
(v) Transfer Pricing	(e) Relationship between profit and sales

(1×5 = 5 marks)

(b) From the following choose the most appropriate answer:

- (i) Labour Cost Variance is the difference between
- Standard labour cost and actual labour cost
 - Fixed labour cost and variable labour cost
 - Estimated labour cost and standard labour cost
- (ii) If the PV ratio is 40% and the sales value is Rs.10,000, the variable cost is:
- Rs. 40,000
 - Rs.4,000
 - None of the above
- (iii) If sales and fixed cost remains unchanged, contribution will remain unchanged when
- Revised profit increased
 - Fixed costs at new capacity are increased
 - Variable cost per unit increases
- (iv) If sales are Rs.2 lacs, fixed cost Rs.30,000, and the PV ratio is 40%, the profit will be
- Rs. 50,000
 - Rs. 80,000
 - Rs. 12,000
- (v) Contribution is known as
- Marginal income
 - Gross Profit
 - Net income
- (1×5 = 5 marks)

- (c) Which of the following statements are TRUE or FALSE?
- Feasible solution in LPP is always optimum solution.
 - ZBB reverses the working process of traditional budgeting.
 - The excess of actual sales revenue over the sales revenue at BEP is known as Margin of Safety.
 - The Balanced Score Card has five perspectives.
 - Just-in-Time deals with controlling defects in time. (1×5= 5 marks)
- (d) Define the following terms in not more than two sentences:
- Benchmark
 - Cost of Capital
 - Decision Model
 - Investment Centre
 - Product Life Cycle (1×5= 5 marks)

Paper - 10 Advanced Financial Accounting

Chapter - 1 : Accounting Principles Concepts & Conventions

2005 - Dec [1] {C} (b) A company has incurred a net loss during an accounting period, but its net worth (assets-liabilities) has increased. How could this happen? (2 marks)

(h) In accordance with the provisions of the Companies Act it is necessary to group the items appearing in the company's balance sheet under certain headings:

What are these headings? (2 marks)

Chapter - 2 : National & International Accounting Standards

2005 - Dec [1] {C} (d) What are the principal sources of Indian GAAP? (2 marks)

(e) Indicate any three areas in respect of which different accounting policies may be adopted by different enterprises. (2 marks)

(f) Define financing activities as suggested in accounting standard 3, to be used for preparing a cash flow statement. (2 marks)

(g) What is the objective of 'Accounting Standards'? (2 marks)

Chapter - 4 : Valuation of Shares

2005 - Dec [1] {C} (c) What is the implication of a high price-earnings (P/E) ratio? (2 marks)

2005 - Dec [3] (a) Explain the meaning of "free reserves" in the context of buy back of shares. State the adjustments that should be made to arrive at the net amount available for the purpose of the buy back. (6 marks)

(b) The Balance Sheet of BXT Ltd. as on 31st March, 2005 was as follows:

	Rs/lakh		Rs/lakh
Share capital		Fixed assets	
Equity shares of Rs. 10		Land and buildings	15.50
each, fully paid	20.00		

Reserves and surplus		Plant and machinery	9.00
General reserve	7.00	Investments	
Securities premium	5.00	Corporate securities	4.00
Profit and loss account	8.00	Current assets	
Secured loan		Stock	7.00
10% debentures	6.00		
Unsecured loan		Debtors	10.00
Term loan	4.00	Cash and Bank	12.00
Current liabilities and provisions			
Trade creditors	5.00		
Accruals	<u>2.50</u>		
	<u>57.50</u>		<u>57.50</u>

The company has decided to buy back the maximum number of equity shares permissible under the law and has completed the necessary formalities in this respect. The buy back is to take place at a price of Rs. 20 per share. Pass the necessary journal entries and prepare the post buy back Balance Sheet. (10 marks)

Chapter - 7 : Internal & External Reconstruction

2005 - Dec [2] Cimex Ltd. is in financial difficulties. Its Balance Sheet as on 31 March, 2005 was as follows:

	Rs		Rs
Share capital		Fixed assets	
Authorised		Intangibles	1,00,000
8% Preference shares		Land and buildings	2,00,000
of Rs. 10 each	14,00,000	Plant and machinery	3,00,000
Equity shares		Investments	1,00,000
of Rs. 10 each	<u>14,00,000</u>	Current assets	
	<u>28,00,000</u>	Stocks	3,00,000
Issued and subscribed		Debtors	2,50,000
8% Preference shares		Bank	50,000
of Rs.10 each,		Miscellaneous expenditure	
fully paid up	12,00,000	Profit and loss	
Equity shares of Rs. 10		account (Dr.)	10,00,000
each, Rs. 7.5			
paid up	4,50,000		
Securities premium	1,50,000		
Unsecured creditors —			
Loans from directors	2,00,000		
Current liabilities and provisions			
Sundry creditors	<u>3,00,000</u>		
	<u>23,00,000</u>		<u>23,00,000</u>

Note: Preference dividend is in arrear for three years.

The following scheme of reorganisation has been prepared and duly sanctioned:

- (1) The unpaid capital in respect of the equity shares are to be called up.
- (2) The equity shares are to be split into shares of Re. 1 each. The equity shareholders are to surrender 80% of their holdings after the split.
- (3) Arrear preference dividends are to be cancelled.
- (4) The preference shareholders are to surrender their holdings and the surrendered shares are to be cancelled.
- (5) For every 20 surrendered preference shares, the shareholders are to receive:
 - (i) 1(one) 10% debentures of Rs. 100 each; and
 - (ii) 30 fully paid equity shares of Re. 1 each (out of those surrendered by the equity shareholders).
- (6) The unutilised surrendered equity shares are to be cancelled.
- (7) The directors are to forego 50% of the amount advanced to the company by way of unsecured loan.
- (8) Tangible fixed assets are to be revalued at:

Land and buildings	Rs. 3,00,000
Plant and machinery	Rs. 2,50,000
- (9) Investments are to be sold at the current market value of Rs. 90,000.
- (10) The profit and loss account debit balance is to be eliminated.
- (11) If any surplus is available, that is to be utilised towards reducing the carrying amount of intangibles.
- (12) The securities premium account is to be kept intact.
- (13) The amount of authorised capital is to remain unchanged.

The scheme is to take effect from 1 April, 2005. Draft the journal entries to give effect to the above and prepare the Balance Sheet after reconstruction. Narrations are not required. Show necessary workings. (8+4+4 = 16 marks)

Chapter - 8 : Holding Companies & Merger Accounts

2005 - Dec [1] {C} (a) What journal entry is made in the holding company's accounts to record dividends received from a subsidiary's pre-acquisition profits? (2 marks)

2005 -Dec [5] The Balance Sheet of Small Ltd. as on 31 st March, 2005 was as under:

<i>Liabilities</i>		<i>Assets</i>	
Share capital		Land and building	4.00
In Equity shares of Rs. 100 each	6.00	Machinery balance B/F	3.50
General reserve	3.00	Less: Depreciation for	
		the year	0.50
Profit and loss A/c		Stock at cost	2.00
Balance B/F	1.20	Debtors	1.50

Profit for the year	0.60	1.80	Cash and Bank balance	1.00
Trade creditors		<u>1.20</u>	Preliminary expenses	<u>0.50</u>
		<u>12.00</u>		<u>12.00</u>

Big Ltd. purchased 4000 Equity shares of Rs. 100 each on 1st October, 2004 on which date it was found that Land and Buildings were under valued by Rs. 1 lakh and machinery was worth only Rs. 2.75 lakhs. In preparing the consolidated Balance Sheet of holding company, it was decided to adopt proper values of Assets, and write off preliminary expenses. On the above information given.

- Ascertain:
- Capital Profits
 - Revenue profits and
 - Minority interest
- (8+4+4= 16 marks)

Chapter - 14 : Investment Accounts

2005 - Dec [7] On 1.4.2004 Ramen had 25,000 equity shares of 'X' Ltd. at a book value of Rs. 15 per share (face value Rs. 10). On 20.6.2004, he purchased another 5000 shares of the company at Rs. 16 per share. The Directors of 'X' Ltd. announced a Bonus and rights issue. No dividend was payable on these issues. The terms of the issue are as follows:

- Bonus basis 1:6 (date 16-8-2004)
- Rights basis 3:7 (date 31-8-2004) price Rs. 15 per share
- Due date for payment 30-9-2004

Shareholders can transfer their rights in full or in part. Accordingly Ramen sold 331/3% of his entitlement to Rupen for a consideration of Rs. 2 per share.

Dividends: Dividends for the year ended 31-3-2004 at the rate of 20% were declared by X Ltd. and received by Ramen on 31.10.04. Dividend for shares acquired by him on 20-6-04 are to be adjusted against the cost of purchase.

On 15-11-2004 Ramen sold 25,000 equity shares at a premium of Rs. 5 per share.

You are required to prepare in the books of Ramen:

- Investment Account
- Profit & Loss Account

For your exercise, assume that the books are closed on 31-12-2004 and shares are valued at average cost. (16 marks)

Chapter - 15 : Preparation of Accounts from Incomplete Records

2005 - Dec [6] A Trader keeps his books under Single Entry system. On 31st March, 2004 his statement of affairs stood as follows:

<i>Liabilities</i>		<i>Assets</i>	
	Rs.		Rs.
Capital account	3,00,000	Fixed assets	1,50,000
Trade creditors	5,80,000	Stock	6,10,000
Bills payable	1,25,000	Trade debtors	1,48,000

Outstanding Expenses	45,000	Bills receivable	60,000
		Un-expired insurance	2,000
		Cash in hand and at bank	80,000
	<u>10,50,000</u>		<u>10,50,000</u>

The following was the summary of Cash Book for the year ended 31st March, 2005:

<i>Receipts</i>		<i>Payments</i>	
	Rs.		Rs.
Cash in hand and at Bank on 1st April, 2004	80,000	Payment to Trade creditors	75,07,000
Cash sales	73,80,000	Payments for Bills payable	8,15,000
Receipts from Trade Debtors	15,10,000	Sundry expenses paid	6,20,700
Receipts for Bills Receivable	<u>3,40,000</u>	Drawings	2,40,000
	<u>93,10,000</u>	Cash in hand and at Bank	<u>1,27,300</u>
			<u>93,10,000</u>

Discount allowed to Trade debtors and Received from Trade creditors amounted to Rs. 36,000 and Rs. 28,000 respectively. Bills endorsed amounted to Rs. 15,000. Annual Fire Insurance premium of Rs. 6,000 was paid every year on 1st August for the Renewal of the policy. Fixed assets were subject to depreciation @ 10% per annum on diminishing balance method.

You are also informed about the following balances as on 31st March, 2005:

	Rs.
Stock	6,50,000
Trade debtors	1,52,000
Bills receivable	1,40,000
Outstanding expenses	5,000

The Trader maintains a steady Gross Profit Ratio of 10% on sale.

Prepare Trading and Profit & Loss Account for the year ended 31st March, 2005 and Balance Sheet as at that date. (16 marks)

Chapter - 17 : Accounting for Non Profit Making Organisation

2005 - Dec [4] Modern City School is a privately run educational institution. Its Balance Sheet as on 31st March, 2004 was as follows:

	Rs.		Rs.
Capital fund	20,00,000	Land	8,00,000
Development fund	10,00,000	School buildings	15,00,000
Special donation fund	6,00,000	School bus	8,00,000
General fund	6,50,000	Furniture	2,00,000
Employee super annuation fund	5,00,000	Laboratory equipment	
		Science lab	50,000
Outstanding salaries (March, 2005)		Computer lab	2,00,000

Teaching staff	1,50,000	Library books	2,50,000
Non-teaching staff	80,000	Investments in	
		Govt. securities	8,00,000
Outstanding electricity bill	20,000	Tuition fee outstanding	60,000
		Cash and Bank	<u>3,40,000</u>
	<u>50,00,000</u>		<u>50,00,000</u>

Receipt and payment account for the year ended 31st March, 2005

	Rs.		Rs.
Opening balance	3,40,000	Salaries	
Admission fee	9,00,000	Teaching staff	58,00,000
Tuition fee	80,00,000	Non-teaching staff	10,00,000
Contribution to special donation funds (from ex-students)	3,00,000	Purchase of library books	1,00,000
		Purchase of science lab equipment	50,000
Interest on investments	75,000	Purchase of computers	60,000
		Construction of new school buildings	4,00,000
		Purchase of school bus	6,00,000
		Purchase of Govt. securities	5,00,000
		Education tour expenses	1,50,000
		Annual function	1,00,000
		Building maintenance expenses	1,50,000
		Purchase of new furniture	60,000
		Electricity	80,000
		Printing, postage stationary and other expenses	1,40,000
	<u>96,15,000</u>	Closing balance	<u>4,25,000</u>
			<u>96,15,000</u>

The following further information is available:

- (1) Interest accrued but not received Rs. 10,000
- (2) The school has decided to charge depreciation as follows:

School buildings (excluding new construction)	5%
School furniture (excluding new additions)	10%
Lab equipment	
Science lab (old & new)	8%
Computer lab (old & new)	20%
School bus (excluding the one newly acquired during the year)	15%
Library books (old & new)	10%
- (3) Amount to be contributed to employee superannuation fund during the year Rs. 1,50,000
- (4) Outstanding expenses at the end of the year:

Staff salaries	
Teaching Staff	Rs. 80,000
Non-teaching Staff	" 20,000
Telephone bill	" 2,000
(5) Building contractor's bill outstanding as on 31st March, 2005	" 70,000
(6) Tuition fee receivable as on 31st March, 2005	" 50,000
(7) Admission fee includes Rs. 2,50,000 representing collection towards development fund.	

You are required to prepare an income and expenditure account for the year ended 31st March, 2005 and a Balance Sheet as on that date.

(8+8 = 16 marks)

Chapter - 20 : Insurance Claims

2005 - Dec [1] {C} (i) What is the importance of 'Average Clause' in an insurance policy for Loss of Stock? (2 marks)

Chapter - 21 : Electricity Company Accounts

2005 - Dec [1] {C} (j) For what purposes contingency reserve may be utilised by an electricity undertaking? (2 marks)

Chapter - 22 : Government Accounting in India

2005 - Dec [8] Write short notes on the following:

- The application of double entry principle in Government accounts;
- Accounting for commercial undertakings run by Government departments;
- Contingency Funds, and
- Indian Audit and Accounts Department. (4×4= 16 marks)

Paper - 11 Auditing

Chapter - 1 : Auditing Techniques and Practices

2005 - Dec [3] (c) Briefly state how compliance procedures are helpful to an auditor. (6 marks)

2005 - Dec [6] (a) About what are Generally Accepted Accounting Principles (GAAP) are concerned with? Discuss about the need for GAAP in India. (6 marks)

2005 - Dec [7] (a) Do you think that related party disclosure is required in the following cases?

- Two companies have a common director who is able to affect the policies of one of them. (1 mark)
- Transactions between an Enterprise and the specified relatives of its key management personnel. (2 marks)
- Transaction between an Enterprise and Trade Union which sometimes restricts the freedom of the Enterprise. (1 mark)

Chapter - 2 : Verification of Assets and Liabilities**2005 - Dec [1] {C}** (b) Briefly comment on the following:

- (iii) Disclosure of a guarantee furnished as a security or cover:
 - (a) For an existing liability which is already recorded in books. (3 marks)
 - (b) For a contingent liability. (2 marks)

2005 - Dec [2] (a) As an auditor of a limited company state your views on the following facts noticed by you in the course of audit:

- (i) Fixed assets acquired in exchange for the shares of the company are recorded at normal values.
- (ii) Proposed dividend is not adjusted in the Financial Statements.
- (iii) Government Grant Received as compensation for losses sustained in backward areas is credited to revenue reserve.
- (iv) No depreciation is charged on an equipment kept idle throughout the year. (2×4 = 8 marks)

2005 - Dec [5] (b) How will you vouch/verify the following and what are the important allied aspect to be considered?

- (i) Royalty payments to a foreign collaborator, to whom royalty is payable as a percentage of sales..
- (ii) Disposal of plant. (4 marks each)

Chapter - 4 : Statutory Auditors**2005 - Dec [1] {C}** (b) Briefly comment on the following:

- (i) Mr. B, chartered accountant, is appointed as statutory auditor of G Ltd., in which three Government companies jointly hold 35% of the subscribed share capital. The appointment of Mr. B has been through an ordinary resolution passed in the duly convened annual general meeting. (3 marks)
- (ii) Since the appointment of Mr. V as a statutory auditor in an annual general meeting is held to be void ab-initio, the company holds another general meeting and appoints Mr. C through a special resolution. (2 marks)

2005 - Dec [2] (b) How does the cost auditor ensure the adequacy or otherwise of the budgetary control system existing in a company for purposes of cost audit? (8 marks)**2005 - Dec [4]** (a) Explain the concept of Joint Audit and state the responsibilities of Joint Auditors. (6 marks)**2005 - Dec [8]** (a) Cost Audit can be considered as part of Management Audit. Discuss the scope of Cost Audit and explain how are these inter related and different from each other. (12 marks)**Chapter - 5 : Audit Report****2005 - Dec [8]** (b) Distinguish between Audit Report and Audit Certificate. (4 marks)

Chapter - 6 : Divisible Profits

2005 - Dec [4] (c) What are the items under "Reserves and Surplus" appearing on the liabilities side of the Balance Sheet of a company which are not available for declaration of dividends? (*any four items*) (4 marks)

Chapter - 8 : Internal Auditing

2005 - Dec [6] (b) 'Financial Audit suffers from a number of limitations.' — Discuss. (10 marks)

Chapter - 9 : MAOCARO and Internal Audit

2005 - Dec [4] (b) Briefly list out the points of distinction between the Companies Auditor's Report Order, 2003 (CARO) and Section 227 of the Companies Act is the order intended to limit the duties and responsibilities of the auditors. Are all private companies exempt from the applicability of the said order? (6 marks)

Chapter - 13 : Flow Chart Techniques

2005 - Dec [3] (a) What are the conditions or events peculiar to an EDP environment that increase the risk of fraud and error? (4 marks)

2005 - Dec [5] (a) Write short notes on:

- (i) EDP application controls; (4 marks)

Chapter - 15 : Audit Notes and Working Papers

2005 - Dec [5] (a) Write short notes on:

- (ii) Summary Internal Audit Report. (4 marks)

Chapter - 16 : Auditing of Enterprises

2005 - Dec [7] (b) How would you audit 'Inventory Control and Management' as an Internal Auditor? (12 marks)

Chapter - 17 : Internal Auditor and the Investigation of Frauds

2005 - Dec [3] (b) What factors lead the auditor to suspect the possibility of fraud and error in manually maintained accounts? (6 marks)

Chapter - 19 : Objective Questions

2005 - Dec [1] {C} (a) Discuss with reasons, whether the following statements are true or false:

(Answers without reasons will not be given any credit)

- (i) The auditor of a company who attended the general meeting spoke first about the accounts of the company. Later he wanted to express his views about a matter relating to proposed expansion plans; the board of directors have the power to prevent him from expressing such views. (2 marks)
- (ii) A company can refuse to provide access to its books of accounts to the company's auditor outside the normal working hours of the company, as it will inconvenience the accounts staff. (2 marks)
- (iii) Companies can charge depreciation at rates lower than the rates prescribed in Schedule XIV of Companies Act, 1956. (1 mark)
- (iv) Unpaid dividends can be kept by the company without any time limit (2 marks)

- (v) Reclassification of long-term investment as short-term investment is made at cost as on the date of such classification. (1 mark)
- (vi) Audit is concerned with ethics of business. (1 mark)
- (vii) Cost auditor has right of access to the financial books of the company. (1 mark)

Paper - 12 Quantitative Methods

Chapter - 1 : Algebra of Vectors

2005 - Dec [1] {C} Attempt the following:

- (b) If $i + 2j + 3k$ and $2i + 4j + 4k$ be the position vectors of points A and B , find the unit vector along . (2 marks)

2005 - Dec [2] (a) If $(5, 2, 3)$, $(-1, -1, 5)$ and $(2, 4, -3)$ be the position vectors of three points A , B and C respectively with respect to origin $O(0, 0, 0)$ then show that they are vertices of a right angled isosceles triangle. (5 marks)

Chapter - 2 : Matrix Algebra

2005 - Dec [1] {C} Attempt the following:

- (a) If $A =$, $B =$, show that $|AB| = |A| \times |B|$. (2 marks)

2005 - Dec [2] (b) If $A =$ and $B =$, then show that $AB \neq BA$ but $(A + B)(A - B) = (A^2 - B^2) - (AB - BA)$. (5 marks)

- (c) Solve by Cramer's rule: $x + y + z = 4$, $2x + 3y + z = 2$ and $8y - 3z = 2$. (5 marks)

Chapter - 3 : Differential Calculus

2005 - Dec [1] {C} Attempt the following:

- (c) If $f(x) = e^{ax+b}$ then show that $f'(x) = e^{2b}$. (2 marks)
- (d) Draw the graph of $f(x) = [x]$ for $-1 \leq x \leq 1$. (2 marks)
- (e) Evaluate . (2 marks)
- (f) Differentiate x^5 w.r.t. x^2 . (2 marks)
- (g) If $y = 3^x \log x$, prove that $x \frac{dy}{dx} = 3^x$. (2 marks)
- (h) Find the slope of the curve $\log xy = x^2 + y^2$ at the point $(1, 1)$. (2 marks)

- (j) If $f(x, y) = x^2 + y^2$, find f_{xx} . (2 marks)

2005 - Dec [3] (a) Verify that the function $u = 6x^2 - 2y^2 - 12x - 16y$ has a saddle point. (5 marks)

(b) A function $f(x)$ is defined as follows:

$$\begin{aligned} f(x) &= 2x - 1 \text{ if } x < 3, \\ &= k \text{ if } x = 3, \\ &= 8 - x \text{ if } x > 3. \end{aligned}$$

For what value of k $f(x)$ is continuous at $x = 3$? With this value of k draw the graph. (5 marks)

(c) If $y = (x + \dots)^n$, show that $(x^2 + 4)^{3/2} + n(x - n \dots)y = 0$. (5 marks)

2005 - Dec [4] (a) For a certain establishment cost and revenue functions are $C = x^3 - 12x^2 + 48x + 11$ and $R = 83x - 4x^2 - 21$ both in rupees respectively, obtain the maximum profit, Here $x =$ output. (5 marks)

Chapter - 4 : Integration

2005 - Dec [1] {C} Attempt the following:

(i) Evaluate $\int x e^x dx$. (2 marks)

2005 - Dec [4] (b) Evaluate $\int e^x dx$. (5 marks)

(c) Find the area of the region bounded by the curves $y = x^2$ and $y = \dots$. (5 marks)

Chapter - 5 : Linear Programming

2005 - Dec [5] (a) Maximize $z = 5x_1 + 7x_2$ subject to $2x_1 + 3x_2 \leq 13$, $3x_1 + 2x_2 \leq 12$, $x_1 \geq 0$, $x_2 \geq 0$ by simplex method. (5 marks)

Chapter - 7 : Transportation

2005 - Dec [5] (b) Obtain the initial basic feasible solution to the following transportation problem by least cost method and determine the cost associated with this solution:

To \ From ↓	D ₁	D ₂	D ₃	Supply	
O ₁	12	19	16	14	
O ₂	19	13	22	16	
O ₃	8	28	14	12	
Demand	17	15	10	42	(5 marks)

Chapter - 8 : Queuing Theory

2005 - Dec [5] (c) In a bank cheques are cashed at a single “teller” counter. Customers arrive at the counter in a Poisson manner at an average rate of 30 customers per hour. The teller takes on the average a minute and a half to cash a cheque. The service time has been shown to be exponentially distributed. Calculate the percentage of time the teller is busy and average time a customer is expected to wait in the system. (5 marks)

Chapter - 9 : Probabilities

2005 - Dec [6] {C} Attempt the following (choose the correct alternative stating proper reason):

(a) Probability of obtaining an even number in a single throw of an unbiased die is

- (i) $\frac{1}{6}$ (ii) 1 (iii) $\frac{1}{2}$ (iv) $\frac{5}{6}$ (2 marks)

(b) If $P(A) = \dots$, $P(B) = \dots$ and $P(A/B) = \dots$, then the value of $P(B/A)$ is

- (i) $\frac{1}{2}$ (ii) $\frac{1}{3}$ (iii) $\frac{1}{4}$ (iv) $\frac{1}{6}$ (2 marks)

(c) If for two independent events A and B, $P(A) = 0.4$, $P(A \cup B) = 0.7$, the value of $P(B)$ is

- (i) 0.25 (ii) 0.3 (iii) 0.2 (iv) 0.5 (2 marks)

- (d) If a random variable X assumes only two values $+1$ and -1 such that $P(X = 1) = P(X = -1)$, then $V(X)$ is
 (i) $\frac{1}{2}$ (ii) 1 (iii) $\frac{3}{4}$ (iv) 0 (2 marks)
- (e) If for a binomial distribution, $P(\text{success in a trial}) = \frac{1}{2}$, $P(\text{no failure}) = \frac{1}{4}$, then the probability of atleast one success is
 (i) $\frac{1}{4}$ (ii) $\frac{1}{2}$ (iii) $\frac{3}{4}$ (iv) 1 (2 marks)
- (f) For a Poisson distribution with mean 4 , the coefficient of variation is
 (i) 200% (ii) 100% (iii) 50% (iv) 25% (2 marks)
- (g) For a standard normal variable Z , $P(0 \leq Z \leq 1) = 0.34$. Then $P(Z \geq -1)$ is equal to
 (i) 0.32 (ii) 0.84 (iii) 0.68 (iv) 0.16 (2 marks)

2005 - Dec [7] (a) Box 1 contains 2 white and 2 black balls, Box 2 contains 2 white and 1 black balls. One of the boxes is selected at random and one ball is drawn from it. Find the probabilities that (i) it turns out to be white, (ii) it is selected from Box 1 if the ball drawn is white. (5 marks)

(b) The probability that A speaks the truth is 0.4 and that B speaks the truth is 0.7 . What is the probability that they will contradict each other? (5 marks)

2005 - Dec [8] (a) What is the probability of guessing correctly at least 6 of 10 answers in a TRUE-FALSE objective test? (5 marks)

Chapter - 10 : Population and Sampling

2005 - Dec [6] {C} Attempt the following (choose the correct alternative stating proper reason):

- (i) In order to test $H_0 : p = \frac{1}{2}$ against $H_1 : p = \frac{1}{4}$, a coin is tossed 4 times where p is the probability of a head in tossing a coin once. H_0 is rejected if and only if the number of heads is 0 or 4. Then power of the test is
 (i) $\frac{1}{16}$ (ii) $\frac{1}{8}$ (iii) $\frac{1}{4}$ (iv) $\frac{1}{2}$ (2 marks)
- (j) If a random sample of size 4 with mean 50 is drawn from a normal population with mean μ and variance 25, then the 95% confidence interval for μ (where $dt = 0.025$) is
 (i) $(45.1, 54.9)$ (ii) $(-4.9, 4.9)$ (iii) $(47.55, 52.45)$ (iv) $(0, 54.9)$ (2 marks)

2005 - Dec [8] (b) If the random variable X follows a normal distribution with mean 18 and variance 625, find the value of

- (i) $P(X > -31)$ and (ii) $P(X < 67 | X > -31)$ where it is given that $dt = 0.025$. (5 marks)

2005 - Dec [9] (b) From a population 3, 5, 6, 7, 9, 10 of 6 units, find the sampling distribution of sample mean of sample random samples without replacement of size two. Then show that mean of sample means is exactly equal to the population mean. (5 marks)

2005 - Dec [11] (a) I.Q. test was administered to 5 persons before and after they are trained. The results are given below:

Candidates: A B C D E

I.Q. before training:	70	80	83	92	85
I.Q. after training:	80	78	85	96	81

Test whether there is any improvement in I.Q. after the training. Given that $t_{0.05,4} = 2.13$. (5 marks)

(b) A die is thrown 120 times of which 1 comes 20 times, 2 or 3 comes 45 times, 4 or 5 comes 40 times and 6 comes 15 times. Test whether the die is perfect or not. Given upper 5% point of the Chisquare distribution at 3 and 5 d.f are 7.81 and 11.07 respectively. (5 marks)

Chapter - 13 : Simple Regression

2005 - Dec [6] {C} Attempt the following (choose the correct alternative stating proper reason):

(h) If for two variables X and Y , correlation coefficient = -0.6 , $V(X) = 9$, $V(Y) = 16$, then the regression coefficient of X on Y is
 (i) 0.45 (ii) 0.8 (iii) -0.8 (iv) -0.45 (2 marks)

2005 - Dec [9] (a) For the variables x and y the regression equations are $4x - y + 8 = 0$ and $7x - 3y + 39 = 0$. Identify the regression equation of x on y and that of y on x . Find the means of x and y and correlation coefficient between x and y . (5 marks)

2005 - Dec [10] (b) The following results were obtained from the record of age (x) and blood pressure (y) of a group of 10 women:

	x	y
Mean	53	142
Variance	130	165
	$\sum(x - \bar{x})(y - \bar{y}) = 1220$	

Find the regression equation of y on x and use it to estimate the blood pressure of a woman of age 45. (5 marks)

Chapter - 14 : Decision Theory

2005 - Dec [10] (a) Pay-offs of acts X , Y and Z , and the states of nature L , M and N are as follows:

	Act		
State of nature	X	Y	Z
L	25	-10	-125
M	400	440	400
N	650	740	750

The probabilities of the states of nature are respectively 0.1, 0.7 and 0.2. Calculate EMV and conclude which of the acts can be chosen as the best. (5 marks)

Chapter - 15 : Demand Analysis

2005 - Dec [12] Attempt the following:

(a) If $(x + 3)^3 p = 4$, compute the elasticity of demand in terms of x . (2 marks)

- (b) Find the average cost function when the marginal cost function is $3x^2 - 4x + 6$ Rs. for output of x units and fixed cost of Rs. 30. (2 marks)

2005 - [13] Answer the following:

- (a) A demand law is given by $x = 80 - 4p$ where x is the quantity demanded and p is the price of a commodity. If the price elasticity of demand at $p = 8$ is increased by 50%, obtain the percentage decrease in demand. (5 marks)

2005 - Dec [13] (f) Write short notes on the following:

- (i) Elasticity of demand, (5 marks)

Chapter - 16 : Forecasting Techniques

2005 - Dec [12] Attempt the following:

- (c) If the quarterly trend equation of production of sugar in a company is $y = 5.27 + 0.04t$ with origin = 3rd quarter of 1983 and unit of $t = 1$ quarter, find the trend equation based on annual sales with origin 1983 and unit of $t = 1$ year. (2 marks)

- (f) Deseasonalise the data using multiplicative model of tea production:

Quarters	:	I	II	III	IV
Production ('000 tons)	:	26.4	27	24	32
Seasonal index	:	110	90	120	80

(2 marks)

- (g) Find r_{23} if $r_{23.1} = 0.6$ and $r_{12} = r_{13} = 0.5$. (2 marks)
 (h) If the multiple regression equation of X_1 on X_2 and X_3 is $X_1 = 0.6X_2 + 0.4X_3 - 14$, $r_{13.2} = 0.8$ and $V(X_3) = 16$, find $V(X_1)$. (2 marks)

2005 - [13] Answer the following:

- (b) Find the trend values from the following time series data by method of moving average with suitable period to be obtained by you from the data:

Year	:	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Profit (in lakh Rs.)	:	463	495	479	481	513	494	493	528	518	514	540	500

(5 marks)

- (d) In a trivariate distribution,

Mean : $= 60, 70, = 100,$

s.d : $s_1 = 3, s_2 = 4, s_3 = 5,$

Correlation coefficient : $r_{12} = 0.7, r_{13} = 0.6, r_{23} = 0.4,$

Find the multiple regression line of x_1 on x_2 and x_3 . Estimate x_1 for $x_2 = 80, x_3 = 120$. (5 marks)

- (f) Write short notes on the following:

(ii) Partial correlation coefficient, (5 marks)

(iii) Least square theory. (5 marks)

Chapter - 17 : Index Number

2005 - Dec [12] Attempt the following:

- (d) Show that Paasche's price index number can be written as weighted harmonic mean of price relatives. (2 marks)

- (e) If $p_{oi} q_{oi} = 979$ and Laspeyre's price index number is 110%, find the sum $p_{oi} q_{oi}$. (2 marks)

2005 - [13] Answer the following:

- (c) Calculate the price index number by Fisher's method:

Commodity ↓	Year → 2000 (base)		2004 (current)	
	Price (Rs.)	Total value (Rs.)	Price (Rs.)	Total value (Rs.)
A	10	100	12	120
B	12	144	14	196
C	14	140	16	192
D	16	192	18	216

(5 marks)

Chapter - 18 : Production Function Analysis and Miscellaneous

2005 - [13] Answer the following:

- (e) Given the following input-output table:

Production	Consumer		Final demand
	Steel	Coal	
Steel (in ton)	0.3	0.1	40
Coal (in ton)	0.6	0.4	80
Labour (mandays)	6	3	

Find the gross production of steel and coal and also the total labour required. (5 marks)

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