Paper 10- Cost & Management Accountancy

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Full Marks: 100   Time allowed: 3 Hours

<u>Section A</u>

1. Answer Question No.1 which is compulsory carrying 25 Marks

   (a) Answer the following   [5 x 2 = 10]

   (i) A company's Sales ₹ 3,00,000, Profit ₹ 60,000 Fixed Cost ₹ 90,000. What is the Contribution?
   (ii) If Actual Material consumed is 900 Kgs at the Rate of ₹ 8 and Standard Quantity of material to be used is 1000 Kgs at the rate of ₹ 6 Per Kg, what is the Material Price Variance?
   (iii) Output of a Process was 2,500 units. Normal loss is 10% of input and abnormal loss 200 units. How many units were introduced in the Process?
   (iv) A Transport company is running three buses having capacity of 50 passengers in each bus, covering a distance of 100 Kms daily. What is the number of passenger kilometers per day?
   (v) Profit as per Financial Books is ₹ 1,28,000 arrived after providing for depreciation of ₹ 18,000 and Interest on Capital ₹ 4,000. Compute the Profit as per Cost Books if the depreciation charged in Cost Accounting is ₹ 20,000?

   (b) Match the following   [5 x 1 = 5]

	Column 'A'		Column 'B'
1.	Work Certified	A	Process Costing
2.	Margin of Safety	B	Budgetary Control
3.	Efficiency Variance	C	Contract Costing
4.	Equivalent Production	D	CVP Analysis
5.	Zero Based Budgeting	E	Labour Cost Variance

   (c) As a Cost Auditor, list out the area which you will verify in the area of 'overheads and indirect expenditure'.   [5]

   (d) The Average Cost of a firm is given by the function Average Cost = $x^3 + 12x^2 - 11x$, find the Total Cost, Average Variable Cost & Marginal cost   [5]

   Answer:
   (a)
   (i) Contribution = Fixed Cost + Profit
   　　　　　　　 = ₹90,000 + ₹60,000
   　　　　　　　 = ₹1,50,000

   (ii) Direct material Price Variance = [Standard price – Actual price] x Actual quantity
   　　　　　　　　　　　　　 = [6 – 8] x 900
   　　　　　　　　　　　　　 = 1800 (Adverse)

(iii) Let 'X' be the units introduced then

Normal loss   = 0.10X

Abnormal Loss   = 200 units

Then output will be

$$X – 0.10X – 200 = 2500$$
$$0.90X = 2700$$
$$X = 2700/ 0.90$$
$$= 3000 \text{ units}$$

(iv) Number at passenger kilometers = 3 x 50 x 100

                             = 15,000 passenger km.

(v)

Profit as per financial books	₹1,28,000
Add: Interest on capital	₹4,000
	₹1,32,000
Less: Depreciation over shown in cost Books (18,000 – 20,000)	₹(2,000)
Profit as per cost books	₹1,30,000

(b) Matching

	Column 'A'		Column 'B'
1.	Work Certified	**C**	Contract Costing
2.	Margin of Safety	**D**	CVP Analysis
3.	Efficiency Variance	**E**	Labour Cost Variance
4.	Equivalent Production	**A**	Process Costing
5.	Zero Based Budgeting	**B**	Budgetary Control

(c) A Cost Auditor must verify the following aspects in the area of 'overheads and indirect expenditure'.

➢ That allocation of overheads are as per CAS-3 which deals with overheads;

➢ That allocation of indirect expenditure over production, sales, and distribution is logical and correct;

➢ That compared with the value of production in a production shop, the overhead charges are not excessive;

➢ That the actual indirect expenditure does not exceed budgets or standard expenditure significantly and that any variations are satisfactorily explained and accounted for;

➢ That the relation of indirect expenditure in keeping with the load on individual production shop is appropriate;

➢ correctness of appropriate allocation of overhead expenditure (both production and sales) will be certified by Cost Auditor;

➢ That allocation of overheads between finished products and unfinished products is in accordance with principles as per CAS-3.

(d) Average Cost = $X^3 + 12X^2 – 11X$

Total Cost = $X^4 + 12X^3 – 11X^2$

Marginal Cost = $4X^3 + 36X^2 – 22X$

Section B

(Cost & Management Accounting – Methods & Techniques and Cost Records and Cost Audit)

Answer any three questions from the following Each question carries 17 marks

2. **(a)** A manufacturer with overall (interchangeable among the products) capacity of 1,00,000 machine hours has been so far producing a standard mix of 15,000 units of product A, 10,000 units of product B and C each. On experience, the total expenditure exclusive of his fixed charges is found to be ₹ 2.09 lakhs and the cost ratio among the product approximately 1, 1.5, 1.75 respectively per unit. The fixed charges comes to ₹ 2 per unit. When the unit selling prices are ₹ 6.25 for A, ₹ 7.5 for B and ₹10.5 for C. He incurs a loss.

	Mix-I	Mix-II	Mix-III
A	18,000	15,000	22,000
B	12,000	6,000	8,000
C	7.000	13,000	8,000

As a management accountant what mix will you recommend? **[14]**

(b) Write a short note on angle of incidence **[3]**

Answer:

(a) Let variable cost per unit of A, B, C be ₹ X, ₹ 1.5X and ₹ 1.75X respectively.

A = 15,000 x X = 15,000 X
B = 10,000 x 1.5X = 15,000 X
C = 10,000 x 1.75X = 17,500 X
Total variable cost = 47,500 X
So, we can say, 47,500 X = 2,09,000
or, X = 4.4
Variable cost per unit of A = X = ₹ 4.4
Variable cost per unit of B = 1.5 (4.4) = ₹ 6.6
Variable cost per unit of C = 1.75 (4.4) = ₹ 7.7

Statement showing computation of loss at present mix

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	Selling price	6.25	7.50	10.50	
II.	Variable Cost	4.40	6.60	7.70	
III.	Contribution	1.85	.90	2.80	
Iv.	No. of units at present mix	15,000	10,000	10,000	
V.	Total contribution	27,750	9,000	28,000	64,750
VI.	Fixed Cost				70,000
Vii.	Loss				5,250

Computation of Profit/(loss) at Mix I:

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	No. of units	18,000	12,000	7,000	
II.	Contribution per unit	1.85	0.90	2.80	
III.	Total contribution	33,300	10,800	19,600	63,700
IV.	Fixed cost				70,000
V.	Loss				6,300

Computation of Profit/(loss) at Mix II:

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	no. of units	15,000	6,000	13,000	
II.	Contribution per unit	1.85	0.90	2.80	
III.	Total contribution	27,750	5,400	36,400	69,550
IV.	Fixed cost				70,000
V.	Loss				450

Computation of Profit/(loss) at Mix III:

	Particulars	A (₹)	B (₹)	C (₹)	Total (₹)
I.	no. of units	22,000	8,000	8,000	
II.	Contribution per unit	1.85	0.90	2.80	
III.	Total contribution	40,700	7,200	22,400	70,300
IV.	Fixed cost				70,000
V.	Profit				300

As management accountant, one should recommend Mix III because there is profit of ₹ 300 against loss at other mixes including present mix.

(b) Angle of Incidence is an angle formed at the intersection point of total sales line and total cost line in a formal break even chart. If the angle is larger, the rate of growth of profit is higher and if the angle is lower, the rate of growth of profit is lower. So, growth of profit or profitability rate is depicted by Angle of Incidence.

3. **(a) The standard material cost for 100 kg of chemical D is made up :**

   Chemical A 30 kg. @ ₹ 4 per kg
   Chemical B 40 kg. @ ₹ 5 per kg
   Chemical C 80 kg. @ ₹ 6 per kg

   In a batch 500 kg. of chemical D were produced from a mix of

   Chemical A 140 kg. @ ₹ 588
   Chemical B 220 kg. @ ₹ 1,056
   Chemical C 440 kg. @ ₹ 2,860

   How do you yield mix and price of factors contribute to the variance in the actual cost per 100 kg. of chemical D over the standard cost ?   [12]

(b) A transport service company is running 4 buses between two towns which are 50 miles apart. Seating capacity of each bus is 40 passengers. The following particulars were obtained from their books for April, 2012.

	₹
Wages of Drivers, Conductors and Cleaners	**2,400**
Salaries of office and supervisory staff	**1,000**
Diesel and oil and other oil	**4,000**
Repairs and Maintenance	**800**
Taxation, Insurance, etc.	**1,600**
Depreciation	**2,600**
Interest and other charges	**2,000**

	14,400

Actual passengers carried were 75%of the seating capacity. All the four buses ran on all days of the month. Each bus made one round trip per day. Find out the cost per passenger mile? [5]

Answer:

(a)

Analysis of Given Data

Chemical	Standard Data			Actual Data		
	Quantity	Price (₹)	Value (₹)	Quantity	Price (₹)	Value (₹)
A	30	4	120	28		117.60
B	40	5	200	44		211.20
C	80	6	480	88		572.00
	150		800	160		900.80
Less: Loss	50		-	60		-
	100		800	100		900.80

Computation of Required Values

Chemical	(1) SQSP (₹)	(2) RSQSP (₹)	(3) AQSP (₹)	(4) AQAP (₹)
A	30 × 4 =120	32.00 x 4 = 128.00	28 x 4 = 112.00	117.60
B	40 × 5 =200	42.67 x 5= 213.35	44 x 5 = 220.00	211.20
C	80 × 6= 480	85.33 x 6= 512.00	88 x 6 = 528.00	572.20
	800.00	853.35	860.00	900.80

Computation of RSQ:

$$RSQ = \left(\frac{SQ \text{ for that product}}{SQ \text{ for all product}} \right) \times AQ \text{ for that product}$$

For A $= \left(\frac{30}{150} \right) \times 160 = 32.00$ units

For B $= \left(\frac{40}{150} \right) \times 160 = 42.67$ units

For C $= \left(\frac{80}{150} \right) \times 160 = 85.33$ units

Where (1) SQSP = Standard cost for Standard material = ₹800

(2) RSQSP = Revised standard cost of material = ₹ 853.35

(3) AQSP = Standard cost of actual material = ₹ 860.00

(4) AQAP = Actual cost of material = ₹ 900.80

Computation of Required Variances

(a) Material yield variance = (1) – (2) = ₹53.35 (A) [₹800 – ₹853.35]

(b) Material Mix variance = (2) – (3) = ₹6.65 (A) [₹853.35 – ₹860]

(c) Material usage variance = (1) – (3) = ₹60 (A) [₹800 – ₹860]

(d) Material price variance = (3) – (4) = ₹40.80 (A) [₹860 – ₹900.80]

(e) Material cost variance = (1) – (4) = ₹100.80 (A) [₹800 – ₹900.80]

(b) Computation of Cost per Passenger Mile:

Passenger miles = No. of buses x Distance x Round trip x No. of Passengers x No. of days in month x Capacity.

= 4 x 50 x 2 x 40 x 30 x 75%

= 3,60,000 miles

Cost per passenger mile = 14,400 / 3,60,000

= ₹ 0.04

4. **company produces four products, viz. P, Q, R and S. The data relating to production activity are as under:**

Product	Quantity of production	Material cost/unit ₹	Direct labour hours/unit	Machine hours/unit	Direct Labour cost/unit ₹
P	1,000	10	1	0.50	6
Q	10,000	10	1	0.50	6
R	1,200	32	4	2.00	24
S	14,000	34	3	3.00	18

Production overheads are as under: ₹

(i)	Overheads applicable to machine oriented activity:	1,49,700
(ii)	Overheads relating to ordering materials	7,680
(iii)	Set up costs	17,400
(iv)	Administration overheads for spare parts	34,380
(v)	Material handling costs	30,294

The following further information has been compiled:

Product	No. of set up	No. of materials orders	No. of times materials handled	No. of spare parts
P	3	3	6	6
Q	18	12	30	15
R	5	3	9	3
S	24	12	36	12

Required:

(i) **Select a suitable cost driver for each item of overhead expense and calculate the cost per unit of cost driver.**

(ii) **Using the concept of activity based costing, compute the factory cost per unit of each product.** **[17]**

Answer:

(i) Computation of Cost Driver Rate

1. Overheads relating to Machinery oriented activity
   Cost Driver -----> Machine Hour Rate
   (1000 x 0.5) + (1000 x 0.5) + (1200 x 2) + (14000 x 3)
   1,49,700/ 49,900 = ₹3 per hour

2. Overheads relating to ordering materials
   Cost driver -----> No. of material orders
   7,680/ 30 = ₹256 per order

3. Set up costs
   Cost drivers ----->No. of set ups
   1,7400/50 = ₹348 per set up

4. Administrative overheads for spare parts
   Cost driver -------> No. of spare parts
   34380/ 36 = ₹955 per spare parts

5. Material handling costs
   Cost driver -----> No. of times materials handled
   30,294/ 81 = ₹374 per material handling

(ii) Computation of factory cost for each product per unit (₹)

	P (₹)		Q (₹)		R (₹)		S (₹)	
Materials		10.0		10.00		32.00		34.00
Labour		6.0		6.00		24.00		18.00
overheads								
Machine oriented activity	1.500		1.50		6.00		9.00	
ordering of Materials	0.768		0.31		0.64		0.22	
Set up costs	1.044		0.63		1.45		0.60	
Administrative Spare Parts	5.730		1.43		2.39		0.82	
Material handling	2.244	11.2	1.12	4.99	2.81	13.29	0.96	11.60
Factory Cost ₹		27.2		20.99		69.29		63.60

5. (a) For production of 10000 units the following are budgeted expenses:

	Per Unit ₹
Direct materials	**48**
Direct Labour	**24**
Variable Overheads	**20**
Fixed Overheads (₹120000)	**12**
Variable expenses (Direct)	**4**
Selling expenses (10% fixed)	**12**
Administration expenses (₹40000 fixed)	**4**
Distribution expenses (20% fixed)	**4**
	128

Prepare a budget for production of 7000 units and 9000 units. [11]

(b) A factory engaged in the production of Chemical X and in the course of manufacture in a by-product-Y is produced which after a separate process has a commercial value. Following are the information for the month of March.

JOINT EXPENSES	SEPARATE EXPENSES	
	X	Y
Materials (₹)10,000	2,000	2,800
Labour (₹) 4,000	2,500	2,500
Overheads (₹) 2,500	1,400	1,000

The output for the month was 150 quintals of X and 50 quintals of Y. The selling price of Product Y is ₹ 200 per quintal. The profit on product Y is 33 1/3% on cost price. Prepare an Account to show the cost of X per quintal. **[6]**

Answer:

(a)

Flexible Budget

Particulars	10000 Units		7000 Units		9000 Units	
	CPU	Total	CPU	Total	CPU	Total
A) Marginal Cost:						
direct Material	48	4,80,000	48	3,36,000	48	4,32,000
direct Labour	24	2,40,000	24	1,68,000	24	2,16,000
Variable expenses	4	40,000	4	28,000	4	36,000
Variable overheads	20	2,00,000	20	1,40,000	20	1,80,000
Selling expenses	10.80	1,08,000	10.80	75,600	10.80	97,200
distribution expenses	3.20	32,000	3.20	22,400	3.20	28,800
Total (A)	110.00	11,00,000	110.00	7,70,000	110.00	9,90,000
B) Fixed Cost:						
Fixed overheads	12.00	1,20,000		1,20,000		1,20,000
Selling expenses	1.20	12,000		12,000		12,000
Administration overheads	4.00	40,000		40,000		40,000
distribution expenses	0.80	8,000		8,000		8,000
Total (B)	18.00	1,80,000		1,80,000		1,80,000
grand Total (A+B)	128.00	12,80,000		9,50,000		11,71,000

(b)

Joint Expenses Account

Dr.   Cr.

Particulars	Amount ₹	Particulars	Amount ₹
To, Material	10,000	By, Y A/c	1,200
To, Labour	4,000	By, X's A/c	15,300
To, Overheads	2,500		
	16,500		16,500

X's Account

Particulars	Amount ₹	Particulars	Amount ₹
Dr.			Cr.
To, Material	2,000	By, Cost of production A/c @ 141.33 per quintal	21,200
To, Labour	2,500		
To, Overheads	1,400		
To, Joint expenses A/c*	15,300		
	21,200		21,200

Y's Account

Particulars	Amount ₹	Particulars	Amount ₹
Dr.			Cr.
To, Material	2,800	By, Cost of production A/c	7,500
To, Labour	2,500		
To, Overheads	1,000		
To, Joint expenses A/c	1,200		
	7,500		7,500

6. (a) What is the significance of different forms in Companies (Cost Records & Audit) Rules 2014? [8]

(b) What are duties and liabilities of a Cost Auditor of a company relating to reporting of Frauds identified during Audit? [9]

Answer:

(a) CRA - 1: Maintain Cost Records in Form CRA - 1.

Every company under rule 5 including all units and branches thereof, shall, in respect of each of its financial year commencing on or after the 1 st day of April, 2014, maintain cost records in **Form CRA-1.**

CRA - 2: Form of intimation of appointment of Cost Auditor by the Company to Central Government.

Every company referred to in rule 6(1) shall inform the cost auditor concerned of his or its appointment as such and file a notice of such appointment with the Central Government within a period of thirty days of the Board meeting in which such appointment is made or within a period of one hundred and eighty days of the commencement of the financial year, whichever is earlier, through electronic mode, in **Form CRA-2,** along with the fee as specified in Companies (Registration Offices and Fees) Rules, 2014.

CRA - 3 : Form of the Cost Audit Report.

Every cost auditor, who conducts an audit of the cost records of a company, shall submit the cost audit report along with his or its reservations or qualifications or observations or suggestions, if any, in **Form CRA-3.**

CRA - 4 : Form for filing Cost Audit Report with the Central Government.

Every company covered under rule 6 shall, within a period of thirty days from the date of receipt of a copy of the cost audit report, furnish the Central Government with such

report along with full information and explanation on every reservation or qualification contained therein, in **Form CRA-4** along with fees specified in the Companies (Registration Offices and Fees) Rules, 2014.

(b) Reporting of fraud by Cost Auditor -
  1) For the purpose of sub-section (12) of section 143, in case the auditor has sufficient reason to believe that an offence involving fraud, is being or has been committed against the company by officers or employees of the company, he shall report the matter to the Central Government immediately but not later than sixty days of his knowledge and after following the procedure indicated herein below:
   (i) auditor shall forward his report to the Board or the Audit Committee, as the case may be, immediately after he comes to knowledge of the fraud, seeking their reply or observations within forty-five days;
   (ii) on receipt of such reply or observations the auditor shall forward his report and the reply or observations of the Board or the Audit Committee along with his comments (on such reply or observations of the Board or the Audit Committee) to the Central Government within fifteen days of receipt of such reply or observations;
   (iii) in case the auditor fails to get any reply or observations from the Board or the Audit Committee within the stipulated period of forty-five days, he shall forward his report to the Central Government along with a note containing the details of his report that was earlier forwarded to the Board or the Audit Committee for which he failed to receive any reply or observations within the stipulated time.
  2) The report shall be sent to the Secretary, Ministry of Corporate Affairs in a sealed cover by Registered Post with Acknowledgement Due or by Speed post followed by an e-mail in confirmation of the same.
  3) The report shall be on the letter-head of the auditor containing postal address, e-mail address and contact number and be signed by the auditor with his seal and shall indicate his Membership Number.
  4) The report shall be in the form of a statement as specified in Form ADT-4.

Section C

(Economics for managerial decision making)
Answer any two from the following each question carries 12 marks

7. **(a) How products are Priced under Monopoly market?** [6]

   (b) Write about Income Elasticity of demand? [6]

Answer:
(a) Price and Output Determination:
   The following conditions are essential for the determination of price and output under Monopoly.
   ➢ The main aim of the Monopolist is to get the maximum profits. He must produce the goods to that extent where MC becomes equal to MR. At that level he will get the equilibrium position and maximum profits.

- ➢ If the monopolist increases the supply of commodities then the average revenue and marginal revenue curves fall down from left to right. If he wants to sell more output he must reduce the price level and therefore the revenue curves are falling with the increase of output.
- ➢ Under monopoly the AR is equal to the price, so AR is the demand line.
- ➢ Under monopoly the MR falls more rapidly than the AR
- ➢ The monopoly on AR line which is more than MR and AC. The differences between AC and AR are the amount of abnormal profits

(b) Income Elasticity Of Demand:

The income elasticity of demand explains the proportionate change in income and proportionate change in demand. The rate of change in the demand due to the change in the income is called income elasticity of demand.

$$\text{Income Elasticity of demand} = \frac{\text{Proportion change in demand}}{\text{Proportion chnange in income}}$$

Types of income elasticity of demand:

1. Zero income elasticity of demand: If the change in the income fails to bring any change in demand, it is called zero income elasticity of demand. (E_y=0).
2. Negative income elasticity of demand: If the demand decreases with the increase in the income is called negative income elasticity of demand.
3. Unitary income elasticity of demand: If the proportionate change in the demand is equal to proportionate change in the income, it is called unitary income elasticity of demand (E_y=1)
4. Income elasticity of demand is greater than one: If the proportionate change in the demand is more than the proportionate change in income, it is called relatively income elastic of demand (E_y>1).
5. Income elasticity of demand is less than one: If the proportionate change in the demand is less than the proportionate change in the income, it is called relatively income inelastic demand (E_y <1).

8.(a) Given below are the figures of production (in thousand mounds) of a Sugar factory:

Year	2006	2007	2008	2009	2010	2011	2012
Production (000) mounds	40	45	46	42	47	50	46

Fit a Straight line trend by the Least Squares Method and tabulate the trend. [8]

(b) P = $\frac{150}{q^2+2} - 4$ represents the demand function for a product where 'p' is the price per unit per 'q' units; determine the marginal revenue function [4]

Answer:

(a) Calculation of trend values by Least Square Method

Year t	Production (000 mounds) Y	Time deviation(X)	X²	XY	Trend Values Y_c
2006	40	-3	9	-120	42.035
2007	45	-2	4	-90	43.071
2008	46	-1	1	-46	44.107
2009	42	0	0	0	45.143

2010	47	+1	1	+47	46.179
2011	50	+2	4	+100	47.215
2012	46	+3	9	+138	48.250
N = 7	$\sum Y = 316$	$(\sum X = 0)$	$(\sum X^2 = 28)$	$(\sum XY = 29)$	$(\sum Y_C = 316)$

$Y_c = a + bX = a + b$ (5-2009)

$a = \dfrac{\sum Y}{N} = \dfrac{316}{7} = 45.143$

$b = \dfrac{\sum XY}{\sum X^2} = \dfrac{29}{28} = 1.036$

$Y_c = 45.143 + 1.036\ X$

When X =3, Y_c = 45.143 + (1.036 – 3) = 42.035, similarly we can calculate trend values for other years

(b) $P = \dfrac{150}{q^2 + 2} - 4$

Revenue (R) = $\dfrac{150}{q^2 + 2} - 4q$

M. R = $\dfrac{dR}{dq} = \dfrac{q^2 + 2(150) - 150q \times 2q}{(q^2 + 2)^2} - 4$

$= \dfrac{150q^2 - 300 \times 300q^2}{(q^2 + 2)^2} - 4$

9.(a) A manufacturer can sell 'x' items per month, at price P = 300 - 2x. Manufacturer's cost of production ₹ Y of 'x' items is given by Y = 2x + 1000. Find no. of items to be produced to yield maximum profit p.m. **[6]**

(b) The total cost function of a manufacturing firm is given by C = 2x³ - x² + 3x + 5 and the Marginal Revenue = 8 - 3x, X = output, determine the most profitable output of the firm. **[6]**

Answer:

(a) Units = x

Price = 300 – 2x

Revenue (R) = Px = $300x - 2x^2$

Cost (C) = 2x + 1,000

Profit (z) = $300x - 2x^2 - 2x - 1,000$

$-2x^2 + 298x - 1000$

$\dfrac{dz}{dx} = -4x + 298 = 0$

$-4x = -298$

$x = \dfrac{298}{4} = 74.5$

$\dfrac{d^2Z}{dx^2} = -4$ which is Positive

$\dfrac{d^2Z}{dx^2} = <0$

Profit is maximum at x = 74.5 units

(b) C = $2x^3 - x^2 + 3x + 5$

M. R. = 8 − 3x

M. C = $\dfrac{dc}{dx}$ = $6x^2 - 2x + 3$

Profit maximum at MC = MR

$6x^2 - 2x + 3 = 8 - 3x$

$6x^2 + x - 5 = 0$

$6x^2 + 6x - 5x - 5 = 0$

6x (x + 1) − 5(x + 1) = 0

(x + 1) (6x − 5) = 0

X = -1. 6x − 5 = 0

$x = \dfrac{5}{6}$