

PYQ RTP COMPILER

Chp5 Activity Based Costing

Costing CA Intermediate Regular Batch Jan 2025



Past Year Questions (PYQs)

May 2018 to May 2024

PYQ Analysis

Exam	Q No.	Marks	Requirement	Special Points
PYQ - May 2024	2a	8m	Customer Level Operating Income and Ranking	Cost Driver - Delivery Km
PYQ - Nov 2023	6e	5m	What is Cost Driver? Suggest suitable cost drivers	Theory
PYQ - Nov 2023	4a	10m	Total cost p.u. and SP pu for each product using traditional and ABC	Regular
PYQ - May 2023	4b	5m	OH per lab hour, OH Cost Statement using ABC	Regular
PYQ - May 2023	6c	5m	Meaining of ABM	Theory
PYQ - Nov 2022	2c	4m	ABC Overheads Apportionment	ABC Cost allocation
PYQ - Nov 2022	6c	5m	Specify two cost drivers for each business function	Regular
PYQ - May 2022	5a	10m	Total cost p.u. for each product using conventional and ABC	Regular

PYQ Analysis

Exam	Q No.	Marks	Requirement	Special Points
PYQ - Dec 2021	3b	10m	Product wise Operating Income both in case of Abs and ABC, Opinion about deciding the product	Regular
PYQ - July 2021	3b	10m	Cost Allocation, Cost of Unused Capacity and Cost Sheet per quarter and Sales Value	Initial design cost to be amortised in 8 quarters
PYQ - Jan 2021	4b	10m	Total cost p.u. for each product using absorption and ABC	Cal of Direct Labour HoursNo. of order for each product is actually order size
PYQ - Nov 2020	5b	6m	Cost Driver Rate, Cost Allocation using ABC	Regular
PYQ - Nov 2020	5c	4m	Levels of activities under ABC	Regular
PYQ - Nov 2019	2a	10m	Customer level operating income, Analytical Comments	Comments are Good. Compare cases sold, discount, gross margin and profitability
PYQ - May 2019	3b	10m	Total cost p.u. for each product using absorption and ABC and Cost Distortion	Same as Module
PYQ - Nov 2018	3b	10m	Total cost p.u. for each product using absorption and ABC	NA
PYQ - May 2018	4a	10m	Total cost p.u. for each product using absorption and ABC and Difference	Machines hours is basis of absorption is silent

PYQ May 2024 – Q2a

- (a) *Luxury Designer Pvt. Ltd. is a manufacturing company, which manufactures readymade designer shirts. It has four customers: two wholesale category customers and two retail category customers. It has developed the following Activity- Based Costing system:*

<i>Activity</i>	<i>Cost Driver Rate (₹)</i>
<i>Order Processing</i>	<i>1,260 per purchase order</i>
<i>Customer Visits</i>	<i>1,500 per customer visit</i>

<i>Regular Delivery</i>	<i>30 per delivery Km. travelled</i>
<i>Expedited Delivery</i>	<i>4,490 per expedited delivery</i>

List selling price per shirt is ₹ 1,000 and average cost per shirt is ₹ 600. CEO of Luxury Designer Pvt. Ltd. wants to evaluate the profitability of each of the four customers for the year 2023, to explore opportunities for increasing profitability of his Company in the next year 2024. The following data in context of four customers are available for 2023:

PYQ May 2024 – Q2a

	Wholesale Customers		Retail Customers	
	WC-1	WC-2	RC-1	RC-2
Number of Purchase orders	50	65	224	245
Number of Customer visits	10	13	25	22
Regular Deliveries	46	52	175	198
Kilometers travelled per delivery	20	15	10	25
Expedited Deliveries	5	16	50	62
Average Number of Shirts per Shirt	215	110	18	15
Average Selling Price per Shirt	₹ 700	₹ 800	₹ 900	₹ 950

You are required to:

Calculate the customer-level operating income and operating income as a % of revenues in 2023 and rank them on the basis of relative profitability.

PYQ May 2024 – Q2a

(a) Working note:

Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

	Wholesale Category Customers		Retail Category Customers	
	WC-1	WC-2	RC-1	RC-2
Number of shirts sold (a)	10,750 (215x50)	7,150 (110x65)	4,032 (18x224)	3,675 (15x245)
Revenues (at listed price) (₹): (b) {(a) × ₹ 1,000}	1,07,50,000	71,50,000	40,32,000	36,75,000
Discount (₹): (c) {(a) × Discount per shirt}	32,25,000	14,30,000	4,03,200	1,83,750
Cost of shirts (₹) : (d) {(a) × ₹ 600}	64,50,000	42,90,000	24,19,200	22,05,000
Order taking costs (₹):	63,000	81,900	2,82,240	3,08,700

PYQ May 2024 – Q2a

(No. of purchase × ₹1,260)				
Customer visits costs (₹) (No. of customer visits × ₹ 1,500)	15,000	19,500	37,500	33,000
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles × ₹ 30 per km.)	27,600	23,400	52,500	1,48,500
Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 4,490}	22,450	71,840	2,24,500	2,78,380
Total cost of customer level operating activities (₹)	1,28,050	1,96,640	5,96,740	7,68,580

PYQ May 2024 – Q2a

Computation of Customer level operating income

	Wholesale Category Customers		Retail Category Customers	
	WC-1	WC-2	RC-1	RC-2
Revenues (At list price) (Refer to working note)	1,07,50,000	71,50,000	40,32,000	36,75,000
Less: Discount (Refer to working note)	32,25,000	14,30,000	4,03,200	1,83,750
Revenue	75,25,000	57,20,000	36,28,800	34,91,250

PYQ May 2024 – Q2a

(At actual price)				
Less: Cost of shirts (Refer to working note)	64,50,000	42,90,000	24,19,200	22,05,000
Gross margin	10,75,000	14,30,000	12,09,600	12,86,250
Less: Customer level operating activities costs (Refer to working note)	1,28,050	1,96,640	5,96,740	7,68,580
Customer level operating income	9,46,950	12,33,360	6,12,860	5,17,670
Operating income as a % of revenues	12.584%	21.562%	16.889%	14.828%
Rank	IV	I	II	III

PYQ Nov 2023 – Q4a

- (a) *JH Plastics Limited manufactures three products S, M and L. To date, simple traditional absorption costing system has been used to allocate overheads to products. Total production overheads are allocated on the basis of machine hours. The machine hour rate for allocating production overheads is ₹ 240 per machine hour under the traditional absorption costing system. Selling prices are calculated by adding mark up of 40% of the product cost. Information related to products for the most recent year is as under:*

	Products		
	S	M	L
<i>Units produced and sold</i>	7,500	12,500	9,000
<i>Direct material cost per unit (₹)</i>	158	179	250
<i>Direct labour cost per unit (₹)</i>	40	45	60
<i>Machine hours per unit</i>	0.30	0.45	0.50

PYQ Nov 2023 – Q4a

Number of Machine setups	120	120	160
Number of purchase orders	90	135	125
Number of inspections	100	160	140

The management wishes to introduce activity-based method (ABC) system of attributing production overheads to products and has identified major cost pools for production overheads and their associated cost drivers as follows:

Cost pool	Amount	Cost driver
Purchasing Department Cost	₹ 7,00,000	Number of Purchase orders
Machine setup Cost	₹ 9,00,000	Number of Machine setups
Quality Control Cost	₹ 6,56,000	Number of inspections
Machining Cost	₹ 5,64,000	Machine hours

PYQ Nov 2023 – Q4a

Required:

- (i) Calculate the total cost per unit and selling price per unit for each of the three products using:
 - (a) The traditional costing approach currently used by JH Plastics Limited;
 - (b) Activity based costing (ABC) approach.
- (ii) Calculate the difference in selling price per unit as per (a) and (b) above and show which product is under-priced or over-priced. **(10 Marks)**

PYQ Nov 2023 – Q4a

- (a) (i) (a) Statement showing 'Cost per unit & Selling price per unit – Traditional Method'.

Particular	Products		
	S (₹)	M (₹)	L (₹)
Direct material cost per unit	158	179	250
Direct labour cost per unit	40	45	60
Production overhead @ ₹ 240 per machine hour	72 (₹ 240 x 0.3)	96 (₹ 240 x 0.4)	120 (₹ 240 x 0.5)
Cost per unit	270	320	430
Add: Profit @ 40%	108	128	172
Selling price per unit	378	448	602

- (b) Statement showing 'Cost per unit & Selling price per unit – Activity Based Costing'.

Particular	Activity Drivers	Total Amount (₹)	Products		
			S	M	L
Production (units)	-	-	7500	12500	9000
Machine hours	-	-	2250 (7500 x 0.3)	5000 (12500 x 0.4)	4500 (9000 x 0.5)
			(₹)	(₹)	(₹)
Direct material cost per unit (i)			158	179	250

PYQ Nov 2023 – Q4a

Direct labour cost per unit (ii)			40	45	60
Overheads					
Purchasing department cost (90:135:125)	Number of purchase orders	7,00,000	1,80,000	2,70,000	2,50,000
Machine setup cost (120:120:160)	Number of machine setups	9,00,000	2,70,000	2,70,000	3,60,000
Quality control cost (100:160:140)	Number of inspections	6,56,000	1,64,000	2,62,400	2,29,600
Machining cost (225:500:450)	Machine hours	5,64,000	1,08,000	2,40,000	2,16,000
Total Overhead			7,22,000	10,42,400	10,55,600

PYQ Nov 2023 – Q4a

Overhead Cost per unit (iii)			96.27	83.39	117.29
Total Cost per unit (i+ii+iii)			294.27	307.39	427.29
Add: Profit @ 40%			117.71	122.96	170.92
Selling price per unit			411.98	430.35	598.21

Note: The question may also be solved by calculating cost driver rate & allocating various cost based on cost driver rate. However, there will be no change in any of the answer.

(ii)

Particular	Products		
	S (₹)	M (₹)	L (₹)
Selling price per unit as per Traditional Costing	378	448	602
Selling price per unit as per Activity Based Costing	411.98	430.35	598.21
Difference	(33.98)	17.65	3.79

Product S is underpriced while product M and L is overpriced using Traditional costing approach.

PYQ May 2023 – Q4b

- (b) *Beta Limited produces 50,000 Units, 45,000 Units and 62,000 Units of product 'A', 'B' and 'C' respectively. At present the company follows absorption costing method and absorbs overhead on the basis of direct labour hours. Now, the company wants to adopt Activity Based Costing*

The information provided by Beta Limited is follows:

	Product A	Product B	Product C
<i>Floor Space Occupied</i>	5,000 Sq.Ft.	4,500 Sq.Ft.	6,200 Sq.Ft.
<i>Direct Labour Hours</i>	7,500 Hours	7,200 Hours	7,800 Hours
<i>Direct Machine Hours</i>	6,000 Hours	4,500 Hours	4,650 Hours
<i>Power consumption</i>	32%	28%	40%

PYQ May 2023 – Q4b

Overhead for year are as follows:

	₹
Rent & Taxes	8,63,500
Electricity Expenses	10,66,475
Indirect labour	13,16,250
Repair & Maintenance	<u>1,28,775</u>
	33,75,000

Required:

- (i) Calculate the overhead rate per labour hour under Absorption Costing.
- (ii) Prepare a cost statement showing overhead cost per unit for each product - 'A', 'B' and 'C' as per Activity based Costing. **(5 Marks)**

PYQ May 2023 – Q4b

(b) (i) Calculation of Overhead rate per hour

Total Overheads

Total hours

$$\frac{33,75,000}{22,500} = ₹ 150 \text{ per hour}$$

(ii) Statement showing overhead cost per unit as per Activity Based Costing

Overheads	Cost Driver	Total	Product		
			A	B	C
		₹	₹	₹	₹
Rent & Taxes	Floor space (50:45:62)	8,63,500	2,75,000	2,47,500	3,41,000
Electricity	Power Consumption (32:28:40)	10,66,475	3,41,272	2,98,613	4,26,590
Indirect labour	Labour hours (75:72:78)	13,16,250	4,38,750	4,21,200	4,56,300
Repair & Maintenance	Machine hours (600:450:465)	1,28,775	51,000	38,250	39,525
Total Cost		33,75,000	11,06,022	10,05,563	12,63,415
Units			50,000	45,000	62,000
Cost per Unit			22.12	22.35	20.38

PYQ May 2022 – Q5a

- (a) *Star Limited manufacture three products using the same production methods. A conventional product costing system is being used currently. Details of the three products for a typical period are:*

<i>Product</i>	<i>Labour Hrs. per unit</i>	<i>Machine Hrs. per unit</i>	<i>Materials per Unit¹</i>	<i>Volume in Units</i>
AX	1.00	2.00	35	7,500
BX	0.90	1.50	25	12,500
CX	1.50	2.50	45	25,000

Direct Labour costs ₹ 20 per hour and production overheads are absorbed on a machine hour basis. The overhead absorption rate for the period is ₹ 30 per machine hour.

Management is considering using Activity Based Costing system to ascertain the cost of the products. Further analysis shows that the total production overheads can be divided as follows:

PYQ May 2022 – Q5a

<i>Particulars</i>	<i>%</i>
<i>Cost relating to set-ups</i>	<i>40</i>
<i>Cost relating to machinery</i>	<i>10</i>
<i>Cost relating to material handling</i>	<i>30</i>
<i>Costs relating to inspection</i>	<i>20</i>
<i>Total production overhead</i>	<i>100</i>

The following activity volumes are associated with the product line for the period as a whole. Total activities for the period:

<i>Product</i>	<i>No. of set-ups</i>	<i>No. of movements of Materials</i>	<i>No. of inspections</i>
<i>AX</i>	<i>350</i>	<i>200</i>	<i>200</i>
<i>BX</i>	<i>450</i>	<i>280</i>	<i>400</i>
<i>CX</i>	<i>740</i>	<i>675</i>	<i>900</i>
<i>Total</i>	<i>1,540</i>	<i>1,155</i>	<i>1,500</i>

Required:

- (i) Calculate the cost per unit for each product using the conventional method.*
- (ii) Calculate the cost per unit for each product using activity based costing method.*

PYQ May 2022 – Q5a

(a) (i) Statement showing “Cost per unit” using “conventional method”

Particulars of Costs	AX (₹)	BX (₹)	CX (₹)
Direct Materials	35	25	45
Direct Labour	20	18	30
Production Overheads	60	45	75
Cost per unit	115	88	150

(ii) Statement Showing “Cost per unit using “Activity Based Costing”

Products	AX	BX	CX
Production (units)	7,500	12,500	25,000
	(₹)	(₹)	(₹)
Direct Materials	2,62,500	3,12,500	11,25,000
Direct Labour	1,50,000	2,25,000	7,50,000
Machine Related Costs	45,000	56,250	1,87,500

PYQ May 2022 – Q5a

Products	AX	BX	CX
Setup Costs	2,62,500	3,37,500	5,55,000
Material handling Cost	1,50,000	2,10,000	5,06,250
Inspection Costs	77,000	1,54,000	3,46,500
Total Costs	9,47,000	12,95,250	34,70,250
Cost per unit (Total Cost ÷ Units)	126.267	103.62	138.81

Working Notes:

Calculation of Total Machine hours

Particulars	AX	BX	CX
(A) Machine hours per unit	2	1.5	2.5
(B) Production (units)	7,500	12,500	25,000
(C) Total Machine hours (A× B)	15,000	18,750	62,500

Total Machine hours = 96,250

Total Production overheads = $96,250 \times 30 = ₹ 28,87,500$

PYQ May 2022 – Q5a

Calculation of Cost Driver Rate

Cost Pool	%	Overheads (₹)	Cost Driver (Basis)	Cost Driver (Units)	Cost Driver Rate (₹)
Set up	40	11,55,000	No of set ups	1,540	750 per set up
Machine Operation	10	2,88,750	Machine hours	96,250	3 per machine hour
Material Handling	30	8,66,250	No of material movement	1,155	750 per material movement
Inspection	20	5,77,500	No of inspection	1,500	385 per inspection

PYQ Dec 2021 – Q3b

- (b) A Drug Store is presently selling three types of drugs namely 'Drug A', 'Drug B' and 'Drug C'. Due to some constraints, it has decided to go for only one product line of drugs. It has provided the following data for year 2020-21 for each product line:

	Drugs Types		
	A	B	C
Revenues (in ₹)	74,50,000	1,11,75,000	1,86,25,000
Cost of goods sold (in ₹)	41,44,500	68,16,750	1,20,63,750
Number of purchase orders placed (in nos.)	560	810	630
Number of deliveries received	950	1,000	850
Hours of shelf-stocking time	900	1,250	2,350
Units sold (in Nos.)	1,75,200	1,50,300	1,44,500

Following additional information is also provided:

Activity	Description of activity	Total Cost (₹)	Cost-allocation base
Drug Licence fee	Drug Licence fee	5,00,000	To be distributed in ratio 2:3:5 between A, B and C
Ordering	Placing of orders for purchases	8,30,000	2,000 purchase orders

PYQ Dec 2021 – Q3b

<i>Delivery</i>	<i>Physical delivery and receipt of foods</i>	<i>18,20,000</i>	<i>2,800 deliveries</i>
<i>Shelf stocking</i>	<i>Stocking of goods</i>	<i>32,40,000</i>	<i>4,500 hours of shelf-stocking time</i>
<i>Customer Support</i>	<i>Assistance provided to customers</i>	<i>28,20,000</i>	<i>4,70,000 units sold</i>

You are required to:

- (i) Calculate the operating income and operating income as a percentage (%) of revenue of each product line if:
 - (a) All the support costs (Other than cost of goods sold) are allocated in the ratio of cost of goods sold.*
 - (b) All the support costs (Other than cost of goods sold) are allocated using activity-based costing system.**
 - (ii) Give your opinion about choosing the product line on the basis of operating income as a percentage (%) of revenue of each product line under both the situations as above.*
- (10 Marks)**

PYQ Dec 2021 – Q3b

- (a) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines on the basis of cost of goods sold of each product)

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Revenues: (A)	74,50,000	1,11,75,000	1,86,25,000	3,72,50,000
Cost of Goods sold (COGS): (B)	41,44,500	68,16,750	1,20,63,750	2,30,25,000
Support cost (40% of COGS): (C) (Refer working notes)	16,57,800	27,26,700	48,25,500	92,10,000
Total cost: (D) = {(B) + (C)}	58,02,300	95,43,450	1,68,89,250	3,22,35,000
Operating income: E = {(A)-(D)}	16,47,700	16,31,550	17,35,750	50,15,000
Operating income as a % of revenues: (E/A) × 100)	22.12%	14.60%	9.32%	13.46%

PYQ Dec 2021 – Q3b

Working notes:

1. Total support cost:

	(₹)
Drug Licence Fee	5,00,000
Ordering	8,30,000
Delivery	18,20,000
Shelf stocking	32,40,000
Customer support	28,20,000
Total support cost	92,10,000

2. Percentage of support cost to cost of goods sold (COGS):

$$\begin{aligned} &= \frac{\text{Total support cost}}{\text{Total cost of goods sold}} \times 100 \\ &= \frac{\text{₹ } 92,10,000}{\text{₹ } 2,30,25,000} \times 100 = 40\% \end{aligned}$$

PYQ Dec 2021 – Q3b

3. Cost for each activity cost driver:

Activity (1)	Total cost (₹) (2)	Cost allocation base (3)	Cost driver rate (4) = [(2) ÷ (3)]
Ordering	8,30,000	2,000 purchase orders	₹ 415 per purchase order
Delivery	18,20,000	2,800 deliveries	₹ 650 per delivery
Shelf-stocking	32,40,000	4,500 hours	₹ 720 per stocking hour
Customer support	28,20,000	4,70,000 units sold	₹ 6 per unit sold

(b) Statement of Operating income and Operating income as a percentage of revenues for each product line

(When support costs are allocated to product lines using an activity-based costing system)

PYQ Dec 2021 – Q3b

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Revenues: (A)	74,50,000	1,11,75,000	1,86,25,000	3,72,50,000
Cost & Goods sold	41,44,500	68,16,750	1,20,63,750	2,30,25,000
Drug Licence Fee	1,00,000	1,50,000	2,50,000	5,00,000
Ordering cost* (560:810:630)	2,32,400	3,36,150	2,61,450	8,30,000
Delivery cost* (950:1000:850)	6,17,500	6,50,000	5,52,500	18,20,000
Shelf stocking cost* (900:1250:2350)	6,48,000	9,00,000	16,92,000	32,40,000
Customer Support cost* (175200:150300:144500)	10,51,200	9,01,800	8,67,000	28,20,000
Total cost: (B)	67,93,600	97,54,700	1,56,86,700	3,22,35,000
Operating income C: {(A) - (B)}	6,56,400	14,20,300	29,38,300	50,15,000
Operating income as a % of revenues	8.81%	12.71%	15.78%	13.46%

* Refer to working note 3

PYQ Dec 2021 – Q3b

(ii) Comparison on the basis of operating income as per the percentage (%) of revenue:

(a) When support costs are allocated to product lines on the basis of cost of goods sold of each product

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Operating income as a % of revenues	22.12%	14.60%	9.32%	13.46%

On comparing the operating income as a % of revenue of each product, Drug A is the most profitable product line, though its revenue is least but with highest units sold.

(b) When support costs are allocated to product lines using an activity-based costing system

	Drug A (₹)	Drug B (₹)	Drug C (₹)	Total (₹)
Operating income as a % of revenues	8.81%	12.71%	15.78%	13.46%

On comparing the operating income as a % of revenue of each product, Drug C is the most profitable product line, though its unit sold is least but with highest revenue.

PYQ Jul 2021 – Q3b

- (b) PQR Ltd. is engaged in the production of three products P, Q and R. The company calculates Activity Cost Rates on the basis of Cost Driver capacity which is provided as below:

Activity	Cost Driver	Cost Driver Capacity	Cost (₹)
Direct Labour hours	Labour hours	30,000 Labour hours	3,00,000
Production runs	No. of Production runs	600 Production runs	1,80,000
Quality Inspections	No. of Inspection	8000 Inspections	2,40,000

The consumption of activities during the period is as under:

Activity / Products	P	Q	R
Direct Labour hours	10,000	8,000	6,000
Production runs	200	180	160
Quality Inspection	3,000	2,500	1,500

PYQ Jul 2021 – Q3b

You are required to:

- (i) Compute the costs allocated to each Product from each Activity.*
- (ii) Calculate the cost of unused capacity for each Activity.*
- (iii) A potential customer has approached the company for supply of 12,000 units of a new product. 'S' to be delivered in lots of 1500 units per quarter. This will involve an initial design cost of ₹ 30,000 and per quarter production will involve the following:*

<i>Direct Material</i>	<i>₹ 18,000</i>
<i>Direct Labour hours</i>	<i>1,500 hours</i>

<i>No. of Production runs</i>	<i>15</i>
<i>No. of Quality Inspection</i>	<i>250</i>

Prepare cost sheet segregating Direct and Indirect costs and compute the Sales value per quarter of product 'S' using ABC system considering a markup of 20% on cost.

PYQ Jul 2021 – Q3b

(b) (i) Statement of cost allocation to each product from each activity

	Product			
	P (₹)	Q (₹)	R (₹)	Total (₹)
Direct Labour hours (Refer to working note)	1,00,000 (10,000 Labour hours × ₹10)	80,000 (8,000 Labour hours × ₹10)	60,000 (6,000 Labour hours × ₹10)	2,40,000
Production runs (Refer to working note)	60,000 (200 Production runs × ₹ 300)	54,000 (180 Production runs × ₹ 300)	48,000 (160 Production runs × ₹ 300)	1,62,000
Quality Inspections (Refer to working note)	90,000 (3,000 Inspections × ₹30)	75,000 (2,500 Inspections × ₹ 30)	45,000 (1,500 Inspections × ₹ 30)	2,10,000

Working note:

Rate per unit of cost driver

Direct Labour hours	(₹ 3,00,000/30,000 Labour hours)	₹ 10 per Labour hour
Production runs	(₹ 1,80,000/600 Production runs)	₹ 300 per Production run
Quality Inspection	(₹ 2,40,000/8,000 Inspections)	₹ 30 per Inspection

PYQ Jul 2021 – Q3b

(ii) Computation of cost of unused capacity for each activity

Particulars	(₹)
Direct Labour hours [(₹ 3,00,000 – ₹ 2,40,000) or (6,000 x ₹ 10)]	60,000
Production runs [(₹ 1,80,000 – ₹ 1,62,000) or (60 x ₹ 300)]	18,000
Quality Inspection [(₹ 2,40,000 – ₹ 2,10,000) or (1,000 x ₹ 30)]	30,000
Total cost of unused capacity	1,08,000

PYQ Jul 2021 – Q3b

(iii) Cost sheet and Computation of Sales value per quarter of product 'S' using ABC system

Particulars	(₹)
1500 units of product 'S' to be delivered per quarter	
Initial design cost per quarter (₹ 30,000 / 8 quarters)	3,750
Direct Material Cost	18,000
Direct Labour Cost (1,500 Labour hours x ₹ 10)	15,000
Direct Costs (A)	36,750
Set up Cost (15 Production runs x ₹ 300)	4,500
Inspection Cost (250 Inspections x ₹ 30)	7,500
Indirect Costs (B)	12,000
Total Cost (A + B)	48,750
Add: Mark-up (20% on cost)	9,750
Sale Value	58,500
Selling Price per unit 'S' (₹ 58,500/1500 units)	39

PYQ Jan 2021 – Q4b

- (b) ABC Ltd. manufactures three products X, Y and Z using the same plant and resources. It has given the following information for the year ended on 31st March, 2020:

	X	Y	Z
Production Quantity (units)	1200	1440	1968
Cost per unit:			
Direct Material (₹)	90	84	176
Direct Labour (₹)	18	20	30

Budgeted direct labour rate was ₹ 4 per hour and the production overheads, shown in table below, were absorbed to products using direct labour hour rate. Company followed Absorption Costing Method. However, the company is now considering adopting Activity Based Costing Method.

	Budgeted Overheads (₹)	Cost Driver	Remarks
Material Procurement	50,000	No. of orders	No. of orders was 25 units for each product.
Set-up	40,000	No. of production Runs	All the three products are produced in production runs of 48 units.

PYQ Jan 2021 – Q4b

Quality Control	28,240	No. of Inspections	Done for each production run.
Maintenance	1,28,000	Maintenance hours	Total maintenance hours were 6,400 and was allocated in the ratio of 1:1:2 between X, Y & Z.

Required:

1. Calculate the total cost per unit of each product using the Absorption Costing Method.
 2. Calculate the total cost per unit of each product using the Activity Based Costing Method.
- (10 Marks)**

PYQ Jan 2021 – Q4b

(b) 1.

Traditional Absorption Costing

	X	Y	Z	Total
(a) Quantity (units)	1,200	1,440	1,968	4608
(b) Direct labour per unit (₹)	18	20	30	-
(c) Direct labour hours (a × b)/₹ 4	5,400	7,200	14,760	27,360

Overhead rate per direct labour hour:

= Budgeted overheads ÷ Budgeted labour hours

= (₹ 50,000 + ₹ 40,000 + ₹ 28,240 + ₹ 1,28,000) ÷ 27,360 hours

= ₹ 2,46,240 ÷ 27,360 hours

= ₹ 9 per direct labour hour

Unit Costs:

	X	Y	Z
Direct Costs:			
- Direct Labour (₹)	18.00	20.00	30.00
- Direct Material (₹)	90.00	84.00	176.00
Production Overhead: (₹)	40.50	45.00	67.50
	$\left(\frac{9 \times 18}{4}\right)$	$\left(\frac{9 \times 20}{4}\right)$	$\left(\frac{9 \times 30}{4}\right)$
Total cost per unit (₹)	148.50	149.00	273.50

PYQ Jan 2021 – Q4b

2. Calculation of Cost-Driver level under Activity Based Costing

	X	Y	Z	Total
Quantity (units)	1,200	1,440	1,968	-
No. of orders (to be rounded off for fraction)	48 (1200 / 25)	58 (1440 / 25)	79 (1968 / 25)	185
No. of production runs	25 (1200 / 48)	30 (1440 / 48)	41 (1968 / 48)	96
No. of Inspections (done for each production run)	25	30	41	96
Maintenance hours	1,600	1,600	3,200	6400

Calculation of Cost-Driver rate

Activity	Budgeted Cost (₹) (a)	Cost-driver level (b)	Cost Driver rate (₹) (c) = (a) / (b)
Material procurement	50,000	185	270.27
Set-up	40,000	96	416.67
Quality control	28,240	96	294.17
Maintenance	1,28,000	6,400	20.00

PYQ Jan 2021 – Q4b

Calculation of total cost of products using Activity Based Costing

Particulars	Product		
	X (₹)	Y (₹)	Z (₹)
Direct Labour	18.00	20.00	30.00
Direct Material	90.00	84.00	176.00
Prime Cost per unit (A)	108.00	104.00	206.00
Material procurement	10.81 [(48 x 270.27)/1200]	10.89 [(58 x 270.27)/1440]	10.85 [(79 x 270.27)/1968]
Set-up	8.68 [(25 x 416.67)/1200]	8.68 [(30 x 416.67)/ 1440]	8.68 [(41 x 416.67)/ 1968]
Quality control	6.13 [(25 x 294.17)/1200]	6.13 [(30 x 294.17)/ 1440]	6.13 [(41 x 294.17)/ 1968]
Maintenance	26.67 [(1,600 x 20)/1200]	22.22 [(1,600 x 20)/ 1440]	32.52 [(3,200 x 20)/ 1968]
Overhead Cost per unit (B)	52.29	47.92	58.18
Total Cost per unit (A + B)	160.29	151.92	264.18

Note: Question may also be solved assuming no. of orders for material procurement to be 25 for each product.

PYQ Nov 2020 – Q5b

(b) ABC Ltd. is engaged in production of three types of Fruit Juices:

Apple, Orange and Mixed Fruit.

The following cost data for the month of March 2020 are as under:

Particulars	Apple	Orange	Mixed Fruit
Units produced and sold	10,000	15,000	20,000
Material per unit (₹)	8	6	5
Direct Labour per unit (₹)	5	4	3
No. of Purchase Orders	34	32	14
No. of Deliveries	110	64	52
Shelf Stocking Hours	110	160	170

Overheads incurred by the company during the month are as under :

	(₹)
Ordering costs	64,000
Delivery costs	1,58,200
Shelf Stocking costs	87,560

Required:

- Calculate cost driver's rate.
- Calculate total cost of each product using Activity Based Costing.

(6 Marks)

PYQ Nov 2020 – Q5b

(b) (i) Calculation Cost-Driver's rate

Activity	Overhead cost (₹)	Cost-driver level	Cost driver rate (₹)
	(A)	(B)	(C) = (A)/(B)
Ordering	64,000	34 + 32 + 14 = 80 no. of purchase orders	800
Delivery	1,58,200	110 + 64 + 52 = 226 no. of deliveries	700
Shelf stocking	87,560	110 + 160 + 170 = 440 shelf stocking hours	199

PYQ Nov 2020 – Q5b

(ii) Calculation of total cost of products using Activity Based Costing

Particulars	Fruit Juices		
	Apple (₹)	Orange (₹)	Mixed Fruit (₹)
Material cost	80,000 (10,000 x ₹ 8)	90,000 (15,000 x ₹ 6)	1,00,000 (20,000 x ₹ 5)
Direct labour cost	50,000 (10,000 x ₹ 5)	60,000 (15,000 x ₹ 4)	60,000 (20,000 x ₹ 3)
Prime Cost (A)	1,30,000	1,50,000	1,60,000
Ordering cost	27,200 (800 x 34)	25,600 (800 x 32)	11,200 (800 x 14)
Delivery cost	77,000 (700 x 110)	44,800 (700 x 64)	36,400 (700 x 52)
Shelf stocking cost	21,890 (199 x 110)	31,840 (199 x 160)	33,830 (199 x 170)
Overhead Cost (B)	1,26,090	1,02,240	81,430
Total Cost (A + B)	2,56,090	2,52,240	2,41,430

PYQ Nov 2019 – Q2a

- (a) PQR Ltd has decided to analyse the profitability of its five new customers. It buys soft drink bottles in cases at ₹ 45 per case and sells them to retail customers at a list price of ₹ 54 per case. The data pertaining to five customers are given below:

Particulars					
	A	B	C	D	E
Number of Cases Sold	9,360	14,200	62,000	38,000	9,800
List Selling Price (₹)	54	54	54	54	54
Actual Selling Price (₹)	54	53.40	49	50.20	48.60
Number of Purchase Orders	30	50	60	50	60
Number of Customers visits	4	6	12	4	6
Number of Deliveries	20	60	120	80	40
Kilometers travelled per delivery	40	12	10	20	60
Number of expedite Deliveries	0	0	0	0	2

Its five activities and their cost drivers are:

Activity	Cost Driver
Order taking	₹ 200 per purchase order
Customer visits	₹ 300 per each visit

PYQ Nov 2019 – Q2a

<i>Deliveries</i>	<i>₹ 4.00 per delivery km travelled</i>
<i>Product Handling</i>	<i>₹ 2.00 per case sold</i>
<i>Expedited deliveries</i>	<i>₹ 100 per such delivery</i>

You are required to :

- (i) Compute the customer level operating income of each of five retail customers by using the Cost Driver rates.*
- (ii) Examine the results to give your comments on Customer 'D' in comparison with Customer 'C' and on Customer 'E' in comparison with Customer 'A'. **(10 Marks)***

PYQ Nov 2019 – Q2a

(a) **Working note:**

Computation of revenues (at listed price), discount, cost of goods sold and customer level operating activities costs:

Particular	Customers				
	A	B	C	D	E
Cases sold: (a)	9,360	14,200	62,000	38,000	9,800
Revenues (at listed price) (₹): (b) {(a) × ₹ 54}	5,05,440	7,66,800	33,48,000	20,52,000	5,29,200
Discount (₹): (c) {(a) × Discount per case}	-	8,520 (14,200 cases × ₹ 0.6)	3,10,000 (62,000 cases × ₹ 5)	1,44,400 (38,000 cases × ₹ 3.80)	52,920 (9,800 cases × ₹ 5.40)
Cost of goods sold (₹): (d) {(a) × ₹ 45}	4,21,200	6,39,000	27,90,000	17,10,000	4,41,000

PYQ Nov 2019 – Q2a

Customer level operating activities costs					
Order taking costs (₹): (No. of purchase × ₹ 200)	6,000	10,000	12,000	10,000	12,000
Customer visits costs (₹) (No. of customer visits × ₹ 300)	1,200	1,800	3,600	1,200	1,800
Delivery vehicles travel costs (₹) (Kms travelled by delivery vehicles × ₹ 4 per km.)	3,200	2,880	4,800	6,400	9,600
Product handling costs (₹) {(a) × ₹ 2}	18,720	28,400	1,24,000	76,000	19,600
Cost of expediting deliveries (₹) {No. of expedited deliveries × ₹ 100}	-	-	-	-	200
Total cost of customer level operating activities (₹)	29,120	43,080	1,44,400	93,600	43,200

PYQ Nov 2019 – Q2a

(i) Computation of Customer level operating income

Particular	Customers				
	A (₹)	B (₹)	C (₹)	D (₹)	E (₹)
Revenues (At list price) (Refer to working note)	5,05,440	7,66,800	33,48,000	20,52,000	5,29,200
Less: Discount (Refer to working note)	-	8,520	3,10,000	1,44,400	52,920
Revenue (At actual price)	5,05,440	7,58,280	30,38,000	19,07,600	4,76,280
Less: Cost of goods sold (Refer to working note)	4,21,200	6,39,000	27,90,000	17,10,000	4,41,000
Gross margin	84,240	1,19,280	2,48,000	1,97,600	35,280
Less: Customer level operating activities costs (Refer to working note)	29,120	43,080	1,44,400	93,600	43,200
Customer level operating income	55,120	76,200	1,03,600	1,04,000	(7,920)

PYQ Nov 2019 – Q2a

(ii) Comments

Customer D in comparison with Customer C: Operating income of Customer D is more than of Customer C, despite having only 61.29% (38,000 units) of the units volume sold in comparison to Customer C (62,000 units). Customer C receives a higher percent of discount i.e. 9.26% (₹ 5) while Customer D receive a discount of 7.04% (₹ 3.80). Though the gross margin of customer C (₹ 2,48,000) is more than Customer D (₹ 1,97,600) but total cost of customer level operating activities of C (₹ 1,44,400) is more in comparison to Customer D (₹ 93,600). As a result, operating income is more in case of Customer D.

Customer E in comparison with Customer A: Customer E is not profitable while Customer A is profitable. Customer E receives a discount of 10% (₹ 5.4) while Customer A doesn't receive any discount. Sales Volume of Customer A and E is almost same. However, total cost of customer level operating activities of E is far more (₹ 43,200) in comparison to Customer A (₹ 29,120). This has resulted in occurrence of loss in case of Customer E.

PYQ May 2019 – Q3b

- (b) MNO Ltd. manufactures two types of equipment A and B and absorbs overheads on the basis of direct labour hours. The budgeted overheads and direct labour hours for the month of March 2019 are ₹ 15,00,000 and 25,000 hours respectively. The information about the company's products is as follows:

	Equipment	
	A	B
Budgeted Production Volume	3,200 units	3,850 units
Direct Material Cost	₹ 350 per unit	₹ 400 per unit
Direct Labour Cost		
A: 3 hours @ ₹ 120 per hour	₹ 360	
B: 4 hours @ ₹ 120 per hour		₹ 480

Overheads of ₹ 15,00,000 can be identified with the following three major activities:

Order Processing: ₹ 3,00,000

Machine Processing: ₹ 10,00,000

Product Inspection: ₹ 2,00,000

These activities are driven by the number of orders processed, machine hours worked and inspection hours respectively. The data relevant to these activities is as follows:

	Orders processed	Machine hours worked	Inspection hours
A	400	22,500	5,000
B	200	27,500	15,000
Total	600	50,000	20,000

PYQ May 2019 – Q3b

Required:

- (i) Prepare a statement showing the manufacturing cost per unit of each product using the absorption costing method assuming the budgeted manufacturing volume is attained.*
- (ii) Determine cost driver rates and prepare a statement showing the manufacturing cost per unit of each product using activity based costing, assuming the budgeted manufacturing volume is attained.*
- (iii) MNO Ltd.'s selling prices are based heavily on cost. By using direct labour hours as an application base, calculate the amount of cost distortion (under costed or over costed) for each equipment.*

(10 Marks)

PYQ May 2019 – Q3b

(b) (i) Overheads application base: Direct labour hours

	Equipment	Equipment
	A (₹)	B (₹)
Direct material cost	350	400
Direct labour cost	360	480
Overheads*	180	240
	890	1120

$$\text{*Pre-determined rate} = \frac{\text{Budgeted overheads}}{\text{Budgeted direct labour hours}} = \frac{\text{₹ 15,00,000}}{25,000 \text{ hours}} = \text{₹60}$$

(ii) Estimation of Cost-Driver rate

Activity	Overhead cost	Cost-driver level	Cost driver rate
	(₹)		(₹)
Order processing	3,00,000	600 Orders processed	500
Machine processing	10,00,000	50,000 Machine hours	20
Inspection	2,00,000	15,000 Inspection hours	10

PYQ May 2019 – Q3b

	Equipment	Equipment
	A (₹)	B (₹)
Direct material cost	350	400
Direct labour cost	360	480
Prime Cost(A)	710	880
Overhead Cost		
Order processing 400: 200	2,00,000	1,00,000
Machine processing 22,500: 27,500	4,50,000	5,50,000
Inspection 5,000: 15,000	50,000	1,50,000
Total overhead cost	7,00,000	8,00,000

(Overheads cost per unit for each overhead can also be calculated)

Per unit cost	A (₹)	B (₹)
7,00,000 / 3,200 (B)-A	218.75	
8,00,000 / 3,850 (B)-B		207.79
Unit manufacturing cost (A+B)	928.75	1,087.79

PYQ May 2019 – Q3b

(iii) Calculation of Cost Distortion

	Equipment	Equipment
	A (₹)	B (₹)
Unit manufacturing cost–using direct labour hours as an application base	890.00	1,120.00
Unit manufacturing cost-using activity based costing	928.75	1,087.79
Cost distortion	-38.75	32.21

PYQ Nov 2018 – Q3b

- (b) M/s. HMB Limited is producing a product in 10 batches each of 15000 units in a year and incurring following overheads their on:

	Amount (₹)
Material procurement	22,50,000
Maintenance	17,30,000
Set-up	6,84,500
Quality control	5,14,800

The prime costs for the year amounted to ₹ 3,01,39,000.

The company is using currently the method of absorbing overheads on the basis of prime cost. Now it wants to shift to activity-based costing. Information relevant to Activity drivers for a year are as under:

Activity Driver	Activity Volume
No. of purchase orders	1500
Maintenance hours	9080
No. of set-ups	2250
No. of inspections	2710

PYQ Nov 2018 – Q3b

The company has produced a batch of 15000 units and has incurred ₹ 26,38,700 and ₹ 3,75,200 on materials and wages respectively.

The usage of activities of the said batch are as follows:

Materials orders	48 orders
Maintenance hours	810 hours
No. of set-ups	40
No. of inspections	25

You are required to:

- find out cost of product per unit on absorption costing basis for the said batch.
- determine cost driver rate, total cost and cost per unit of output of the said batch on the basis of activity based costing. **(10 Marks)**

PYQ Nov 2018 – Q3b

(b) Working Note:

$$\text{Overhead Absorption Rate} = \frac{51,79,300}{3,01,39,000} \times 100 = 17.18\%$$

(i) Cost of Product Under Absorption Costing

Item of Cost	Amount (₹)
Material	26,38,700
Wages	3,75,200
Prime Cost	30,13,900
Overheads: $\frac{51,79,300}{3,01,39,000} \times 30,13,900$	5,17,930
Total Cost	35,31,830
Units	15,000
Cost per unit	235.46

(ii) Cost driver rate, total cost and cost per unit on the basis of activity-based costing method Absorption Costing

Calculation of Cost Driver rate:

Activity	₹.	Activity Volume	Cost Driver Rate
Material Procurement	22,50,000	1500	1500

PYQ Nov 2018 – Q3b

Maintenance	17,30,000	9080	190.53
Setup	6,84,500	2250	304.22
Quality Control	5,14,800	2710	189.96

Calculation of total Cost and cost per unit:

Item of Cost	Amount (₹)
Material	26,38,700
Wages	3,75,200
Prime Cost	30,13,900
Material Purchase $\left(\frac{22,50,000}{1,500} \times 48 \right)$	72,000
Maintenance $\left(\frac{17,30,000}{9,080} \times 810 \right)$	1,54,328
Setup $\left(\frac{6,84,500}{2,250} \times 40 \right)$	12,169
Quality Control $\left(\frac{5,14,800}{2,710} \times 25 \right)$	4,749
Total Cost	32,57,146
Unit	15,000
Cost per unit	217.14

PYQ May 2018 – Q4a

- (a) PQR Pens Ltd. manufactures two products - 'Gel Pen' and 'Ball Pen'. It furnishes the following data for the year 2017:

Product	Annual Output (Units)	Total Machine Hours	Total number of Purchase orders	Total number of set-ups
Gel Pen	5,500	24,000	240	30
Ball Pen	24,000	54,000	448	56

The annual overheads are as under:

Particulars	₹
Volume related activity costs	4,75,020
Set up related costs	5,79,988
Purchase related costs	5,04,992

Calculate the overhead cost per unit of each Product - Gel Pen and Ball Pen on the basis of:

- Traditional method of charging overheads
- Activity based costing method and
- Find out the difference in cost per unit between both the methods. **(10 Marks)**

PYQ May 2018 – Q4a

(a) (i) Statement Showing Overhead Cost per unit “Traditional Method”

	Gel Pen (₹)	Ball Pen (₹)
Units	5,500	24,000
Overheads (₹) (Refer to W.N.)	4,80,000 (20 x 24,000 hrs.)	10,80,000 (20 x 54,000 hrs.)
Overhead Rate <i>per unit</i> (₹)	87.27 (₹ 4,80,000 / 5,500 units)	45 (₹ 10,80,000 / 24,000 units)

Working Notes:

Overhead Rate per Machine Hour

$$\begin{aligned} &= \frac{\text{Total Overhead incurred by the Company}}{\text{Total Machine Hours}} \\ &= \frac{\text{₹ 4,75,020} + \text{5,79,988} + \text{5,04,992}}{24,000 \text{ hours} + 54,000 \text{ hours}} = \frac{\text{₹15,60,000}}{78,000 \text{ hours}} \\ &= \text{₹ 20 per machine hour} \end{aligned}$$

PYQ May 2018 – Q4a

(ii) Statement Showing “Activity Based Overhead Cost”

Activity Cost Pool	Cost Driver	Ratio	Total Amount (₹)	Gel Pen (₹)	Ball Pen (₹)
Volume Related Activity Costs	Machine hours	24:54	4,75,020	1,46,160	3,28,860
Setup Related Costs	No. of Setups	30:56	5,79,988	2,02,321	3,77,667
Purchase Related Costs	No. of Purchase Orders	240:448	5,04,992	1,76,160	3,28,832
Total Cost				5,24,641	10,35,359
Output (units)				5,500	24,000
Unit Cost (Overheads)				95.39	43.13

PYQ May 2018 – Q4a

(iii)

	Gel Pen (₹)	Ball Pen (₹)
Overheads Cost per unit (₹) (Traditional Method)	87.27	45
Overheads Cost per unit (₹) (ABC)	95.39	43.13
Difference <i>per unit</i>	-8.12	+1.87

(Volume related activity cost, set up related costs and purchase related cost can also be calculated under Activity Base Costing using Cost driver rate. However, there will be no changes in the final answer.)

Revision Test Papers (RTPs)

May 2018 to Sep 2024

RTP Analysis

Exam	Q No.	Requirement	Special Points
RTP - Sep 2024	Q10	Total cost p.u. for each product using absorption and ABC	Same as Study Material Problem (ml and gm)
RTP - May 2024	Q4	Customer Level Operating Income of each retail customer	Allocation of Deliveries Cost
RTP - Nov 2023	Q4	Overheads Allocation Statement using ABC	Direct and Easy
RTP - May 2023	Q4	Production Cost using ABC	Direct and Easy
RTP – Nov 2022	Q4	Operating Income and % as per ABC, Reasons of difference when compared to Traditional	Very Lengthy and Detailed Calculation of Rates and then its allocation. Part of Incentive is to be taken as Direct Labour
RTP - May 2022	Q4	GM% segment wise and OM% whole OM% segment wise using ABC	Cal of Cost Driver Levels
RTP - Nov 2021	Q4	OM and OM% for each product line using ABC and without ABC both	Same as Module Exercise Q3

RTP Analysis

Exam	Q No.	Requirement	Special Points
RTP - May 2021	Q4	Product Wise Profit Statement for Absorption and ABC	Basic and Easy Absorption Rate is dept wise not blanket unlike other questions
RTP - Nov 2020	Q4	Cal of Cost Driver Rates and Total Cost of Batch	Direct and Easy
RTP - May 2020	Q4	OM and OM% for each product line using ABC and without ABC both	Same as Module Exercise Q3
RTP - Nov 2019	Q4	Overhead Cost per unit using ABC and Selling Price p.u.	Error in Language of Question - Avoid this Question
RTP - May 2019	Q4	Cost of unused capacity	Same as Illustration 2
RTP - Nov 2018	Q4	OM and OM% for each product line using ABC and without ABC both	Same as Module Exercise Q3
RTP - May 2018	Q4	Activity Based Production Cost for Each of the product	Direct and Easy

RTP Nov 2022 – Q4

4. The profit margin of BABY Hairclips Company were over 20% of sales producing BROWN and BLACK hairclips.

During the last year, GREEN hairclips had been introduced at 10% premium in selling price after the introduction of YELLOW hairclips earlier five years back at 10/3% premium. However, the manager of the company is disheartened with the sales figure for the current financial year as follows:

Traditional Income Statement					(in ₹)
	Brown	Black	Yellow	Green	Total
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Direct Labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Overhead (3 times of direct labour)	60,00,000	48,00,000	10,80,000	1,20,000	1,20,00,000
Total Operating Income	20,00,000	16,00,000	4,14,000	60,000	40,74,000
Return on Sales (in %)	13.3%	13.3%	14.8%	18.2%	13.5%

RTP Nov 2022 – Q4

It is a known fact that customers are ready to pay premium amount for YELLOW and GREEN hairclips for their attractiveness; and the percentage returns are also high on new products.

At present, all of the Plant's indirect expenses are allocated to the products at 3 times of the direct labour expenses. However, the manager is interested in allocating indirect expenses on the basis of activity cost to reveal real earner.

He provides support expenses category-wise as follows:

Support Expenses	(₹)
Indirect Labour	40,00,000
Labour Incentives	32,00,000
Computer Systems	20,00,000
Machinery depreciation	16,00,000
Machine maintenance	8,00,000
Energy for machinery	<u>4,00,000</u>
Total	1,20,00,000

RTP Nov 2022 – Q4

He provides following **additional information** for accomplishment of his interest:

Incentives to be allocated @ 40% of labour expenses (both direct and indirect).

Indirect labours are involved mainly in three activities. About half of indirect labour is involved in handling production runs. Another 40% is required just for the physical changeover from one color hairclip to another because YELLOW hairclips require substantial labour for preparing the machine as compared to other colour hairclips. Remaining 10% of the time is spend for maintaining records of the products in four parts.

Another amount spent on computer system of ₹ 20,00,000 is for maintenance of documents relating to production runs and record keeping of the four products. In aggregate, approx.. 80% of the amount expend is involved in the production run activity and approx.. 20% is used to keep records of the products in four parts.

Other overhead expenses i.e. machinery depreciation, machine maintenance and energy for machinery are incurred to supply machine capacity to produce all the hairclips (practical capability of 20,000 hours).

Activity Cost Drivers:

Particulars	Brown	Black	Yellow	Green	Total
Sales Volume (units)	1,00,000	80,000	18,000	2,000	2,00,000
Selling Price (₹)	150	150	155	165	
Material cost (₹)	50	50	52	55	

RTP Nov 2022 – Q4

Machine hours per unit (Hrs)	0.10	0.10	0.10	0.10	20,000
Production runs	100	100	76	24	300
Setup time per run (Hrs)	4	1	6	4	

You are required to –

- (i) CALCULATE operating income and operating income as per percentage of sales using activity-based costing system.
- (ii) STATE the reasons for different operating income under traditional income system and activity-based costing system.

4. (i) Calculation of operating income using Activity Based Costing

Calculation of Cost-Driver rate

Activity	Overhead cost	Allocation	Overhead cost	Cost-driver level	Cost driver rate
	(₹)		(₹)		(₹)
Indirect labour + 40% for incentives	56,00,000	50%	28,00,000	300 Production runs	9,333.33
		40%	22,40,000	1052* Setup hours	2,129.28
		10%	5,60,000	4 Number of parts	1,40,000
Computer Systems	20,00,000	80%	16,00,000	300 Production runs	5,333.33
		20%	4,00,000	4 Number of parts	1,00,000

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Machinery depreciation	16,00,000	100%	16,00,000	20,000 Machine hours	80
Machine Maintenance	8,00,000	100%	8,00,000	20,000 Machine hours	40
Energy for Machinery	4,00,000	100%	4,00,000	20,000 Machine hours	20

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Activity Based Costing

	Brown	Black	Red	Green	Total
Quantity (units)	1,00,000	80,000	18,000	2,000	2,00,000
	(₹)	(₹)	(₹)	(₹)	(₹)
Sales	1,50,00,000	1,20,00,000	27,90,000	3,30,000	3,01,20,000
Less: Material Costs	50,00,000	40,00,000	9,36,000	1,10,000	1,00,46,000
Less: Direct labour	20,00,000	16,00,000	3,60,000	40,000	40,00,000
Less: 40% incentives on direct labour	8,00,000	6,40,000	1,44,000	16,000	16,00,000
(A)	72,00,000	57,60,000	13,50,000	1,64,000	1,44,74,000
Overheads					
Indirect labour + incentives					
- 50% based on Production runs	9,33,333 (9,333.33 x 100)	9,33,333 (9,333.33 x 100)	7,09,334 (9,333.33 x 76)	2,24,000 (9,333.33 x 24)	28,00,000

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Computer Systems	- 40% based on Setup hours	8,51,711 (2,129.28 x 400)	2,12,928 (2,129.28 x 100)	9,70,951 (2,129.28 x 456)	2,04,410 (2,129.28 x 96)	22,40,000
	- 10% based on number of parts	1,40,000 (1,40,000 x 1)	1,40,000	1,40,000	1,40,000	5,60,000
	- 80% based on Production runs	5,33,333 (5,333.33 x 100)	5,33,333 (5,333.33 x 100)	4,05,334 (5,333.33 x 76)	1,28,000 (5,333.33 x 24)	16,00,000
	- 20% based on number of parts	1,00,000 (1,00,000 x 1)	1,00,000	1,00,000	1,00,000	4,00,000
Machinery depreciation		8,00,000 (80 x 0.1 x 1,00,000)	6,40,000 (80 x 0.1 x 80,000)	1,44,000 (80 x 0.1 x 18,000)	16,000 (80 x 0.1 x 2,000)	16,00,000
Machine Maintenance		4,00,000 (40 x 0.1 x 1,00,000)	3,20,000 (40 x 0.1 x 80,000)	72,000 (40 x 0.1 x 18,000)	8,000 (40 x 0.1 x 2,000)	8,00,000

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Energy for Machinery	2,00,000 (20 x 0.1 x 1,00,000)	1,60,000 (20 x 0.1 x 80,000)	36,000 (20 x 0.1 x 18,000)	4,000 (20 x 0.1 x 2,000)	4,00,000
Total Overheads (B)	39,58,377	30,39,594	25,77,619	8,24,410	1,04,00,000
Operating Income (A-B)	32,41,623	27,20,406	(12,27,619)	(6,60,410)	40,74,000
Return on Sales (%)	21.61	22.67	(44.00)	(200.12)	13.53

- (ii) The difference in the operating income under the two systems is due to the differences in the overheads borne by each of the products. The Activity Based Costs appear to be more accurate.

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4. PCP Limited belongs to the apparel industry. It specializes in the distribution of fashionable garments. It buys from the industry and resells the same to the following two different supermarkets:

- (i) Supermarket A dealing in Adults' garments (Age group 15 - 30)
- (ii) Supermarket B dealing in Kids' garments (Age group 5 - 10)

The following data for the month of April in respect of PCP Limited has been reported:

	Supermarket A (₹)	Supermarket B (₹)
Average revenue per delivery	1,69,950	57,750
Average cost of goods sold per delivery	1,65,000	55,000
Number of deliveries	660	1,650

In the past, PCP Limited has used gross margin percentage to evaluate the relative profitability of its supermarket segments.

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The company plans to use activity –based costing for analysing the profitability of its supermarket segments.

The April month's operating costs (other than cost of goods sold) of PCP Limited are ₹ 16,55,995. These operating costs are assigned to five activity areas. The cost in each area and Activity analysis including cost driver for the month of April are as follows:

Activity Area	Total costs (₹)	Cost Driver
Store delivery	3,90,500	Store deliveries
Cartons dispatched to store	4,15,250	Cartons dispatched to a store per delivery
Shelf-stocking at customer store	64,845	Hours of shelf-stocking
Line-item ordering	3,45,400	Line-items per purchase order
Customer purchase order processing	4,40,000	Purchase orders by customers

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Other data for the month of April include the following:

	Supermarket A	Supermarket B
Total number of store deliveries	1,100	2,805
Average number of cartons shipped per store delivery	250	50
Average number of hours of shelf-stocking per store delivery	6	1.5
Average number of line items per order	14	12
Total number of orders	770	1,980

Required:

- COMPUTE gross-margin percentage for each of its supermarket segments and compute PCP Limited's operating income.
- COMPUTE the operating income of each supermarket segments using the activity-based costing information.

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4. (i)

PCP Limited's

Statement of operating income and gross margin percentage
for each of its supermarket segments

Particulars	Supermarket A	Supermarket B	Total
Revenues: (₹)	11,21,67,000 (660 × ₹ 1,69,950)	9,52,87,500 (1,650 × ₹ 57,750)	20,74,54,500
Less: Cost of goods sold: (₹)	10,89,00,000 (660 × ₹ 1,65,000)	9,07,50,000 (1650 × ₹ 55,000)	19,96,50,000
Gross Margin: (₹)	32,67,000	45,37,500	78,04,500
Less: Other operating costs: (₹)			16,55,995
Operating income: (₹)			61,48,505
Gross Margin	2.91%	4.76 %	3.76%
Operating income %			2.96%

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- (ii) **Operating Income Statement of each distribution channel
in April (Using the Activity based Costing information)**

	Supermarket A	Supermarket B
Gross margin (₹) : (A) (Refer to (i) part of the answer)	32,67,000	45,37,500
Operating cost (₹): (B) (Refer to working note)	6,55,600	10,00,395
Operating income (₹): (A–B)	26,11,400	35,37,105
Operating income (in %) (Operating income/Revenue) ×100	2.33	3.71

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Working note:

Computation of rate per unit of the cost allocation base for each of the five activity areas for the month of April

	(₹)
Store delivery [₹ 3,90,500/ (1,100 + 2,805 store deliveries)]	100 per delivery
Cartons dispatched [₹ 4,15,250/ {(250×1,100) + (50×2,805)} carton dispatches]	1 per carton dispatch
Shelf-stocking at customer store (₹) [₹ 64,845/ {(6×1,100) + (1.5×2,805)} hours]	6 per hour
Line item ordering [₹ 3,45,400/ {(14×770) + (12×1,980)} line items]	10 per line item order
Customer purchase order processing [₹ 4,40,000/ (770 + 1,980 orders)]	160 per order

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Computation of operating cost of each distribution channel:

	Supermarket A (₹)	Supermarket B (₹)
Store delivery	1,10,000 (₹ 100 × 1,100 deliveries)	2,80,500 (₹ 100 × 2,805 deliveries)
Cartons dispatched	2,75,000 (₹ 1 × 250 cartons × 1,100 deliveries)	1,40,250 (₹ 1 × 50 cartons × 2,805 deliveries)
Shelf stocking	39,600 (₹ 6 × 1,100 deliveries × 6 Av. hrs.)	25,245 (₹ 6 × 2,805 deliveries × 1.5 Av. hrs)
Line item ordering	1,07,800 (₹ 10 × 14 line item × 770 orders)	2,37,600 (₹ 10 × 12 line item × 1,980 orders)
Customer purchase order processing	1,23,200 (₹ 160 × 770 orders)	3,16,800 (₹ 160 × 1,980 orders)
Operating cost	6,55,600	10,00,395

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4. The following budgeted information relates to N Ltd. for the year 2021:

	Products		
	X	Y	Z
Production and Sales (units)	1,00,000	80,000	60,000
	(₹)	(₹)	(₹)
Selling price per unit	90	180	140
Direct cost per unit	50	90	95
	Hours	Hours	Hours
Machine department (machine hours per unit)	3	4	5
Assembly department (direct labour hours per unit)	6	4	3

The estimated overhead expenses for the year 2021 will be as below:

Machine Department ₹ 73,60,000

Assembly Department ₹ 55,00,000

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Overhead expenses are apportioned to the products on the following basis:

Machine Department On the basis of machine hours

Assembly Department On the basis of labour hours

After a detailed study of the activities the following cost pools and their respective cost drivers are found:

Cost Pool	Amount (₹)	Cost Driver	Quantity
Machining services	64,40,000	Machine hours	9,20,000 hours
Assembly services	44,00,000	Direct labour hours	11,00,000 hours
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups
Order processing	7,20,000	Customer orders	7,200 orders
Purchasing	4,00,000	Purchase orders	800 orders

As per an estimate the activities will be used by the three products:

	Products		
	X	Y	Z
Machine set-ups	4,500	3,000	1,500

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Customer orders	2,200	2,400	2,600
Purchase orders	300	350	150

You are required to PREPARE a product-wise profit statement using:

- (i) Absorption costing method;
- (ii) Activity-based method.

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4. (i) Profit Statement using Absorption costing method:

	Particulars	Product			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	2,40,000
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads:				
(i)	Machine department (₹) (Working note-1)	24,00,000	25,60,000	24,00,000	73,60,000
(ii)	Assembly department (₹) (Working note-1)	30,00,000	16,00,000	9,00,000	55,00,000
G.	Total Cost (₹) [E+F]	1,04,00,000	1,13,60,000	90,00,000	3,07,60,000
H.	Profit (C-G)	(14,00,000)	30,40,000	(6,00,000)	10,40,000

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(ii) Profit Statement using Activity based costing (ABC) method:

	Particulars	Product			Total
		X	Y	Z	
A.	Sales Quantity	1,00,000	80,000	60,000	
B.	Selling price per unit (₹)	90	180	140	
C.	Sales Value (₹) [A×B]	90,00,000	1,44,00,000	84,00,000	3,18,00,000
D.	Direct cost per unit (₹)	50	90	95	
E.	Direct Cost (₹) [A×D]	50,00,000	72,00,000	57,00,000	1,79,00,000
F.	Overheads: (Refer working note-3)				
(i)	Machining services (₹)	21,00,000	22,40,000	21,00,000	64,40,000
(ii)	Assembly services (₹)	24,00,000	12,80,000	7,20,000	44,00,000
(iii)	Set-up costs (₹)	4,50,000	3,00,000	1,50,000	9,00,000
(iv)	Order processing (₹)	2,20,000	2,40,000	2,60,000	7,20,000
(v)	Purchasing (₹)	1,50,000	1,75,000	75,000	4,00,000
G.	Total Cost (₹) [E+F]	1,03,20,000	1,14,35,000	90,05,000	3,07,60,000
H.	Profit (₹) (C-G)	(13,20,000)	29,65,000	(6,05,000)	10,40,000

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Working Notes:

1.

		Products			Total
		X	Y	Z	
A.	Production (units)	1,00,000	80,000	60,000	
B.	Machine hours per unit	3	4	5	
C.	Total Machine hours [A×B]	3,00,000	3,20,000	3,00,000	9,20,000
D.	Rate per hour (₹)	8	8	8	
E.	Machine Dept. cost [C×D]	24,00,000	25,60,000	24,00,000	73,60,000
F.	Labour hours per unit	6	4	3	
G.	Total labour hours [A×F]	6,00,000	3,20,000	1,80,000	11,00,000
H.	Rate per hour (₹)	5	5	5	
I.	Assembly Dept. cost [G×H]	30,00,000	16,00,000	9,00,000	55,00,000

$$\text{Machine hour rate} = \frac{\text{₹73,60,000}}{9,20,000 \text{ hours}} = \text{₹ 8}$$

$$\text{Labour hour rate} = \frac{\text{₹55,00,000}}{11,00,000 \text{ hours}} = \text{₹ 5}$$

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2. Calculation of cost driver rate

Cost Pool	Amount (₹)	Cost Driver	Quantity	Driver rate (₹)
Machining services	64,40,000	Machine hours	9,20,000 hours	7.00
Assembly services	44,00,000	Direct labour hours	11,00,000 hours	4.00
Set-up costs	9,00,000	Machine set-ups	9,000 set-ups	100.00
Order processing	7,20,000	Customer orders	7,200 orders	100.00
Purchasing	4,00,000	Purchase orders	800 orders	500.00

3. Calculation of activity-wise cost

		Products			Total
		X	Y	Z	
A.	Machining hours (Refer Working note-1)	3,00,000	3,20,000	3,00,000	9,20,000
B.	Machine hour rate (₹) (Refer Working note-2)	7	7	7	
C.	Machining services cost (₹) [A×B]	21,00,000	22,40,000	21,00,000	64,40,000

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D.	Labour hours (Refer Working note-1)	6,00,000	3,20,000	1,80,000	11,00,000
E.	Labour hour rate (₹) (Refer Working note-2)	4	4	4	
F.	Assembly services cost (₹) [D×E]	24,00,000	12,80,000	7,20,000	44,00,000
G.	Machine set-ups	4,500	3,000	1,500	9,000
H.	Rate per set-up (₹) (Refer Working note-2)	100	100	100	
I.	Set-up cost (₹) [G×H]	4,50,000	3,00,000	1,50,000	9,00,000
J.	Customer orders	2,200	2,400	2,600	7,200
K.	Rate per order (₹) (Refer Working note-2)	100	100	100	
L.	Order processing cost (₹) [J×K]	2,20,000	2,40,000	2,60,000	7,20,000
M.	Purchase orders	300	350	150	800
N.	Rate per order (₹) (Refer Working note-2)	500	500	500	
O.	Purchasing cost (₹) [M×N]	1,50,000	1,75,000	75,000	4,00,000

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4. SMP Pvt. Ltd. manufactures three products using three different machines. At present the overheads are charged to products using labour hours. The following statement for the month of September 2019, using the absorption costing method has been prepared:

Particulars	Product X (using machine A)	Product Y (using machine B)	Product Z (using machine C)
Production units	45,000	52,500	30,000
Material cost per unit (₹)	350	460	410
Wages per unit @ ₹80 per hour	240	400	560
Overhead cost per unit (₹)	240	400	560
Total cost per unit (₹)	830	1,260	1,530
Selling price (₹)	1,037.50	1,575	1,912.50

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The following additional information is available relating to overhead cost drivers.

Cost driver	Product X	Product Y	Product Z	Total
No. of machine set-ups	40	160	400	600
No. of purchase orders	400	800	1,200	2,400
No. of customers	1,000	2,200	4,800	8,000

Actual production and budgeted production for the month is same. Workers are paid at standard rate. Out of total overhead costs, 30% related to machine set-ups, 30% related to customer order processing and customer complaint management, while the balance proportion related to material ordering.

Required:

- (i) COMPUTE overhead cost per unit using activity based costing method.
- (ii) DETERMINE the selling price of each product based on activity-based costing with the same profit mark-up on cost.

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4. Workings:

Total labour hours and overhead cost:

Particulars	Product X	Product Y	Product Z	Total
Production units	45,000	52,500	30,000	1,27,500
Hour per unit	3	5	7	
Total hours	1,35,000	2,62,500	2,10,000	6,07,500
Rate per hour				₹80.00
Total overhead				₹4,86,00,000

Cost per activity and driver

Activity	Machine Set-up	Customer order processing	Customer complaint management	Total
Total overhead (₹)	1,45,80,000	1,45,80,000	1,94,40,000	4,86,00,000
No. of drivers	600	2,400	8,000	
Cost per driver (₹)	24,300	6,075	2,430	

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Cost per activity and driver

Activity	Machine Set-up	Customer order processing	Customer complaint management	Total
Total overhead (₹)	1,45,80,000	1,45,80,000	1,94,40,000	4,86,00,000
No. of drivers	600	2,400	8,000	
Cost per driver (₹)	24,300	6,075	2,430	

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Particulars	Product X	Product Y	Product Z
No. of machine set-ups	40	160	400
Cost per driver (₹)	24,300	24,300	24,300
Total Machine set-up cost (₹) [A]	9,72,000	38,88,000	97,20,000
No. of purchase orders	400	800	1,200
Cost per driver (₹)	6,075	6,075	6,075
Total order processing cost (₹) [B]	24,30,000	48,60,000	72,90,000
No. of customers	1,000	2,200	4,800
Cost per driver (₹)	2,430	2,430	2,430
Total customer complaint management cost (₹) [C]	24,30,000	53,46,000	1,16,64,000
Total Overhead cost (₹) [A+B+C]	58,32,000	1,40,94,000	2,86,74,000
Production units	45,000	52,500	30,000
Cost per unit (₹)	129.60	268.46	955.80

(ii) **Determination of Selling price per unit**

Particulars	Product X (using machine A)	Product Y (using machine B)	Product Z (using machine C)
Material cost per unit (₹)	350.00	460.00	410.00
Wages per unit @ ₹80 per hour	240.00	400.00	560.00
Overhead cost per unit (₹)	129.60	268.46	955.80
Total cost per unit (₹)	719.60	1,128.46	1,925.80
Profit (25% profit mark-up) (₹)	179.90	282.11	481.45
Selling price (₹)	899.50	1,410.57	2,407.25