Workings :

(1) Production and Sales at 50% Capacity are 5,000 units. So, Production and Sales at 60% capacity level $= 5000 \times \frac{60}{50} = 6{,}000$ units.

(2) Selling price per unit at 60% capacity level = Rs. 100 – 2% of Rs. 100 = Rs. (100 – 2) = Rs. 98.

(3) Material cost per unit at 60% capacity level = Rs. 50+2% of Rs. 50 = Rs. (50+1) = Rs. 51

(4) Cost of Material and Labour are fully variable. Again, non-fixed portion of both Factory Overhead and Administrative Overhead are also fully variable. The per unit cost of all these items remains the same, even if, the activity level is increased from 5,000 units to 6,000 units.

(5) The total of fixed Factory Overhead and fixed Administrative Overhead remains the same although production is increased.

Solution :

Statement showing comparative analysis of costs and sales (for 50% and 60% capacity) profit at 60% capacity for the period....

Particulars	At 50%	Capacity	At 60%	Capacity
	Rate per unit *Rs.*	Total *Rs.*	Rater per unit *Rs.*	Total *Rs.*
A. Sales/Revenue	100·00	5,00,000	98·00	5,88,000
Production Cost/Works Costs :				
(i) Material	50·00	2,50,000	51·00	3,06,000
(ii) Labour	15·00	75,000	15·00	90,000
(iii) Fixed Factory Overhead	6·00	30,000	5·00	30,000
(iv) Variable Factory Overhead	9·00	45,000	9·00	54,000
B. Total Production/Works Cost :	80·00	4,00,000	80·00	4,80,000
C. Gross Profit (A – B)	20·00	1,00,000	18·00	1,08,000
Non-Production Expenses :				
(i) Fixed Administrative Overhead	5·00	25,000	4·17	25,000
(ii) Variable Administrative Overhead	5·00	25,000	5·00	30,000
D. Total Non-production Expenses :	10·00	50,000	9·17	55,000
E. Net Profit (C – D)	10·00	50,000	8·83	53,000

Problem 13.

Fabulous Enterprises is currently working at 50% capacity and produces 10,000 units. At 60% Capacity Working, Raw Material cost increases by 2% and selling price falls by 2%. At 80% capacity working, raw material cost increases by 5% and selling price falls by 3%. At 50% capacity working; the product costs Rs. 180 per unit and is sold at Rs. 200 per unit.

The Unit Cost of Rs. 180 is made up as follows :

	Rs.	
1. Materials	100	
2. Wages	30	
3. Factory Overheads	30	(40% fixed)
4. Administration Overheads	20	(30% fixed)

Prepare a Cost Statement showing the total cost and profit for the three capacity levels.

[D.U.B. Com.—Adapted]

Solution :

Cost Statement

Showing Total Cost and Profit

	50% Capacity 10,000 units		60% Capacity 12,000 units		80% Capacity 16,000 units	
	Per Unit *Rs.*	Total *Rs.*	Per Unit *Rs.*	Total *Rs.*	Per Unit *Rs.*	Total *Rs.*
Variable Costs :						
Materials	100	10,00,000	102	12,24,000	105	16,80,000
Labour	30	3,00,000	30	3,60,000	30	4,80,000
Factory Overheads	18	1,80,000	18	2,16,000	18	2,88,000
Administration Overheads	10	1,00,000	10	1,20,000	10	1,60,000
Total variable costs	158	15,80,000	160	19,20,000	163	26,08,000
Sales	200	20,00,000	196	23,52,000	190	30,40,000
Contribution	42	4,20,000	36	4,32,000	27	4,32,000
Fixed Costs :						
Factory Overheads		1,20,000		1,20,000		1,20,000
Administration Overheads		1,00,000		1,00,000		1,00,000
Total Fixed Costs		2,20,000		2,20,000		2,20,000
Profit		2,00,000		2,12,000		2,12,000
Percentage of Profit on Sale		10%		approx 9%		approx 7%

Problem 14.

A factory is currently running at 50% capacity and produces 5,000 units at a cost of Rs. 90 per unit as per details below :

	Rs.
Material	50
Labour	15
Factory Overheads	15 (Rs. 6 fixed)
Administrative Overheads	10 (Rs. 5 fixed)

The current selling price is Rs. 100 per unit.

At 60% working, material cost per unit increases by 2% and selling price per unit falls by 2%.

At 80% working, material cost per unit increases by 5% and selling price per unit falls by 5%.

Estimate profit of the factory at 60% and 80% working and offer your comments.

[I.C.W.A.—Inter]

Solution :

Flexible Budget

Capacity	50%	60%	80%
Production (Units)	5,000	6,000	8,000
	Rs.	*Rs.*	*Rs. Per Unit*
Material	50	51	52.50
Labour	15	15	15.00
Variable Overheads :			
Factory	9	9	9.00
Administration	5	5	5.00
Variable Cost per unit	79	80	81.50
Total Cost per unit			
Total Variable Cost	3,95,000	4,80,000	6,52,000
Fixed Overheads :			
Factory	30,000	30,000	30,000
Administration	25,000	25,000	25,000
Total Cost of Production	4,50,000	5,35,000	7,07,000
Selling price per unit @ Rs. 100	5,00,000	5,88,000	7,60,000
Profit	50,000	53,000	53,000

Comments : It is clear from above workings that profit has gone up by Rs. 3,000 by utilization of additional 10% Capacity despite given changes. However, by increasing the capacity utilization from 60% to 80%, the profit gets neutralised by increase in Cost and decrease in selling price.

Problem 15.

A company incurs the following expenses to produce 1000 units of an article :

	Rs.
Direct Materials	30,000
Direct Labour	15,000
Power (20% fixed)	10,000
Repairs and Maintenance (15% fixed)	8,000
Depreciation (40% variable expenses)	6,000
Administrative Expenses (100% fixed)	12,000

Prepare a Flexible Budget showing individual expenses of production levels at 1,500 units and 2,000 units. *[C.U. B.Com.(H) 1998]*

Solution :

Flexible Budget
for the period....

Particulars	Level of activity					
	1000 units		1500 units		2000 units	
	Per unit Rs.	Total Rs.	Per unit Rs.	Total Rs.	Per unit Rs.	Total Rs.
1. Prime cost :						
Direct Material	30·00	30,000	30·00	45,000	30·00	60,000
Direct Labour	15·00	15,000	15·00	22,500	15·00	30,000
	45·00	45,000	45·00	67,500	45·00	90,000

2. Variable Overhead :						
Power	8·00	8,000	8·00	12,000	8·00	16,000
Repairs & Maintenance	6·80	6,800	6·80	10,200	6·80	13,600
Depreciation	2·40	2,400	2·40	3,600	2·40	4,800
	17·20	17,200	17·20	25,800	17·20	34,400
3. Marginal cost (1+2)	62·20	62,200	62·20	93,300	62·20	1,24,400
4. Fixed costs :						
Power	2·00	2,000	1·33	2,000	1·00	2,000
Repairs & Maintenance	1·20	1,200	0·80	1,200	0·60	1,200
Depreciation	3·60	3,600	2·40	3,600	1·80	3,600
Administrative expenses	12·00	12,000	8·00	12,000	6·00	12,000
	18·80	18,800	12·53	18,800	9·40	18,800
5. Total Costs (3+4)	81·00	81,000	74·73	1,12,100	71·60	1,43,200

Working Notes :

Segregation of semi-variable expenses into variable and fixed elements :

1. Power (20% fixed and 80% variable at 1,000 units) :

Variable portion of power cost at 1000 units = Rs. $10,000 \times \frac{80}{100}$ = Rs. 8,000

So, variable power cost per unit = Rs. $\frac{8,000}{1,000}$ = Rs. 8/–

Fixed portion of power cost = Rs. (10,000 – 8,000) = Rs. 2,000

2. Repairs & Maintenance (15% fixed and 85% variable at 1000 units) :

Variable portion of power cost = Rs. $8,000 \frac{85}{100}$ = Rs. 6,800

So, variable repairs & maintenance per unit = Rs. $\frac{6,800}{1,000}$ = Rs. 6·80

Fixed portion of Repairs & Maintenance cost = Rs. (8,000 – 6,800) = Rs. 1,200

3. Depreciation (40% variable and 60% fixed at 1000 units) :

Variable portion of depreciation at 1000 units = Rs. $6,000 \times \frac{40}{100}$ = Rs. 2,400

So, variable depreciation cost per unit = Rs. $\frac{2,400}{1,000}$ = Rs. 2·40

Fixed portion of depreciation = Rs. (6,000 – 2,400) = Rs. 3,600

Note :

While variable portion of semi-variable expenses will vary with change in production, the fixed portion of the same will remain fixed.

Problem 16.

A department of company X attains sale of Rs. 6,00,000 at 80 percent of its normal capacity and its expenses are given below :

Administration Costs :

Office Salaries	Rs. 90,000
General Expenses	2 percent of sale
Depreciation	Rs. 7,500
Rates and taxes	Rs. 8,750

Selling Costs :

Salaries	8 percent of sales
Travelling expenses	2 percent of sales
Sales offices	1 percent of sales
General expenses	1 percent of sales

Distribution Costs :

Wages	Rs. 15,000
Rent	1 percent of sales
Other expenses	4 percent of sales

Draw up flexible administration, selling and distribution costs budget, operating at 90 percent, 100 percent and 110 percent of normal capacity.

[B.U. B.Com.—Adapted]

Solution :

X Ltd.

Flexible Budget of Department....

for the period.....

Particulars	Basis	Level of activity			
		80%	90%	100%	110%
Sales		Rs. 6,00,000	Rs. 6,75,000	Rs. 7,50,000	Rs. 8,25,000
Administration costs :					
Office Salaries	Fixed	90,000	90,000	90,000	90,000
General Expenses	2% of Sales	12,000	13,500	15,000	16,500
Depreciation	Fixed	7,500	7,500	7,500	7,500
Rates & Taxes	Fixed	8,750	8,750	8,750	8,750
Total (A)		1,18,250	1,19,750	1,21,250	1,22,750
Selling costs :					
Salaries	8% of sales	48,000	54,000	60,000	66,000
Travelling exp.	2% of sales	12,000	13,500	15,000	16,500
Sales office exp.	1% of sales	6,000	6,750	7,500	8,250
General exp.	1% of sales	6,000	6,750	7,500	8,250
Total (B)		72,000	81,000	90,000	99,000
Distribution costs :					
Wages	Fixed	15,000	15,000	15,000	15,000
Rent	1% of Sales	6,000	6,750	7,500	8,250
Other expenses	4% of Sales	24,000	27,000	30,000	33,000
Total (C)		45,000	48,750	52,500	56,250
Total Adm. Selling & Dist. costs (1+2+3)		2,35,250	2,49,500	2,63,750	2,78,000

Problem 17.

A factory is currently running at 50% capacity and produces 5,000 units at a cost of Rs. 90 per unit as per details below :

	Rs.
1. Materials	50
2. Labour	15
3. Factory Overheads	15 (Rs. 6 fixed)
4. Administrative Overheads	10 (Rs. 5 fixed)

The current selling price is Rs. 100 per unit. At 60% working material cost per unit increases by 2% and selling price per unit falls by 2%.

Estimate profits of the factory at 60% working.

[C.U. B.Com.(H) 1995]

Solution :

Flexible Budget
for the period.....

	At 50% capacity (5000 units)		At 60% capacity (6000 units)	
	Per unit cost	Total cost	Per unit cost	Total cost
	Rs.	Rs.	Rs.	Rs.
1. Sales	100·00	5,00,000	98·00	5,88,000
2. Prime cost :				
Materials	50·00	2,50,000	51·00	3,06,000
Labour	15·00	75,000	15·00	90,000
	65·00	3,25,000	66·00	3,96,000
3. Variable Overhead :				
Factory Overhead	9·00	45,000	9·00	54,000
Administrative Overhead	5·00	25,000	5·00	30,000
	14·00	70,000	14·00	84,000
4. Marginal cost (2+3)	79·00	3,95,000	80·00	4,80,000
5. Contribution (1 – 4)	21·00	1,05,000	18·00	1,08,000
6. Fixed costs :				
Factory Overhead	6·00	30,000	5·00	30,000
Administrative Overhead	5·00	25,000	4·17	25,000
	11·00	55,000	9·17	55,000
7. Net Profit (5-6)	10·00	50,000	8·83	53,000

Working Notes :

1. Production at 50% capacity is 5,000 units. So production at 60% capacity is $\frac{5,000}{50} \times 60 = 6,000$ units.
2. Selling price per unit at 60% capacity level = Rs. 100 – 2% of Rs. 100
   = Rs. 100 – Rs. 2 = Rs. 98
3. Material cost per unit at 60% capacity level = Rs. 50 + 2% of Rs. 50
   = Rs. (50 + 1) = Rs. 51/–

4. Segregation of factory overhead into variable portion and fixed portion :
   variable factory overhead per unit = Rs. (15 – 6) = Rs. 9/-
   Fixed factory overhead per unit at 5,000 units of production = Rs. 6
   So, total fixed factory overhead = 5,000 × Rs. 6 = Rs. 30,000
5. Segregation of Administrative Overhead into fixed portion and variable portion :
   Variable administrative overhead per unit Rs. (10 – 5) = Rs. 5/-
   Fixed administrative overhead per unit at 5,000 units of production level = Rs. 5/-
   So, total fixed administrative overhead = Rs. 5 × 5,000 = Rs. 25,000
6. Variable portion of factory overhead and administrative overhead will vary with production in the same ratio. But fixed factory overhead and administrative overhead will remain unchanged regardless of increase in volume.

Problem 18.

Prepare a flexible budget for overheads on the basis of data given below. Ascertain the overhead rates at 50, 60 and 70 percents capacity.

	At 50% Capacity Rs.	At 60% Capacity Rs.	At 70% Capacity Rs.
Variable Overheads :			
Indirect material		6,000	
Indirect labour		18,000	
Semi-variable Overheads :			
Electricity (40% fixed)		30,000	
Repairs & maintenance (80% fixed)		3,000	
Fixed Overheads :			
Depreciation		16,500	
Insurance		4,500	
Salaries		15,000	
		93,000	

Estimated direct labour hours at 60% capacity — 1,86,000.

[B.U. B.Com.—Adapted]

Solution :

Flexible Budget for Overheads

Particulars	50% capacity Rs.	60% capacity Rs.	70% capacity Rs.
1. Variable overhead :			
Indirect material	5,000	6,000	7,000
Indirect labour	15,000	18,000	21,000
2. Semi-variable overhead :			
Electricity :			
Fixed	12,000	12,000	12,000
Variable	15,000	18,000	21,000
Repairs & Maintenance :			
Fixed	2,400	2,400	2,400
Variable	500	600	700
3. Fixed overheads :			
Depreciation	16,500	16,500	16,500

Contd.

Insurance	4,500	4,500	4,500
Salaries	15,000	15,000	15,000
Total overheads	85,900	93,000	1,00,100
Estimated direct labour hours	1,55,000	1,86,000	2,17,000
Overhead rate per direct labour hour (Re)	0·55	0·50	0·46

Working Notes :

Electricity :

Variable portion at 60% capacity = Rs. $30,000 \times \frac{60}{100}$ (60% being variable)

= Rs. 18,000

Fixed portion at 60% capacity = Rs. (30,000 – 18,000)

= Rs. 12,000

Repairs & Maintenance :

Variable portion at 60% capacity = Rs. $3,000 \times \frac{20}{100}$ (20% being variable)

= Rs. 600.

Fixed Portion at 60% capacity = Rs. (3,000 – 600)

= Rs. 2,400.

Note : Variable portion will vary with change in volume in the same ratio while fixed portion will remain fixed regardless of change in volume.

Problem 19.

The cost of a product at a capacity level of 5000 units is given under A below. For a variation of 20% in capacity above or below this level, the individual expenses vary as indicated under B below :

	A (Rs.)	B
Material cost	25,000	(100% varying)
Labour cost	15,000	(100% varying)
Power	1,250	(80% varying)
Repairs & Maintenance	2,000	(75% varying)
Stores	1,000	(100% varying)
Inspection	500	(20% varying)
Depreciation	10,000	(100% varying)
Administration Overheads	5,000	(25% varying)
Selling Overhead	3,000	(50% varying)
Total cost	62,750	
Cost per unit	12·55	

Find the unit cost of the product under each individual expenses at production levels of 4,000 units and 6,000 units. *[I.C.W.A.—Adapted]*