

# 4

## Budget & Budgetary Control

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### Question 1

*A Company manufactures two Products A and B by making use of two types of materials, viz., X and Y. Product A requires 10 units of X and 3 units of Y. Product B requires 5 units of X and 2 units of Y. The price of X is ₹ 2 per unit and that of Y is ₹ 3 per unit. Standard hours allowed per product are 4 and 3, respectively. Budgeted wages rate is ₹ 8 per hour. Overtime premium is 50% and is payable, if a worker works for more than 40 hours a week. There are 150 workers.*

*The Sales Manager has estimated the sales of Product A to be 5,000 units and Product B 10,000 units. The target productivity ratio (or efficiency ratio) for the productive hours worked by the direct worker in actually manufacturing the product is 80%, in addition, the non-productive downtime is budgeted at 20% of the productive hours worked. There are twelve 5-day weeks in the budget period and it is anticipated that sales and production will occur evenly throughout the whole period.*

*It is anticipated that stock at the beginning of the period will be:*

*Product A 800 units; Product B 1,680 units. The targeted closing stock expressed in terms of anticipated activity during the budget period are Product A 12 days sales; Product B 18 days sales. The opening and closing stock of raw material of X and Y will be maintained according to requirement of stock position for Product A and B.*

*You are required to prepare the following for the next period:*

- (i) Material usage and Material purchase budget in terms of quantities and values.*
- (ii) Production budget.*
- (iii) Wages budget for the direct workers.*

*(8 Marks)(Nov. 2004)*

Answer

(i) Material usage budget

	<i>Products A (units)</i>	<i>Products B (units)</i>	<i>Total material usage units</i>	<i>Cost per unit (₹)</i>	<i>Total cost of materials (₹)</i>
Estimated sales	5,000	10,000			
Material X : 10 units per product A and 5 units per product B	50,000	50,000	1,00,000	2	2,00,000
Material Y : 3 units per product A and 2 units per product B	15,000	20,000	35,000	3	1,05,000
Total	65,000	70,000	1,35,000		3,05,000

## Material Purchase Budget

	<i>X Units</i>	<i>Y Units</i>	<i>Total</i>
Required for sales	1,00,000	35,000	
Add: desired closing stock			
Product A:			
1,000 units (A) × 10 units (X) = 10,000 units of X			
3,000 units (B) × 5 units (X) = 15,000 units of X.	25,000		
Product B:			
1,000 units (A) × 3 units (Y) = 3,000 units of Y		9,000	
3,000 units (B) × 2 units (Y) = 6,000 units of Y.	1,25,000	44,000	
Less: Opening stock			
Product A:			
800 units (A) × 10 units (X) = 8,000 units of X			
1,680 units (B) × 5 units (X) = 8,400 units of X	16,400		
Product B			
800 units (A) × 3 units (Y) = 2,400 units of Y			
1,680 units (B) × 2 units (Y) = 3,360 units of Y.		5,760	
Units to be purchased	1,08,600	38,240	1,46,840
Cost per unit	₹2	₹3	
Cost of purchase (₹)	2,17,200	1,14,720	3,31,920

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#### (ii) Production Budget

	<i>Product A Units</i>	<i>Product B Units</i>
Sales	5,000	10,000
Add: Closing stock**	1,000	3,000
	6,000	13,000
Less: Opening stock	800	1,680
Production	5,200	11,320

\*\*Calculation of closing stock:

Budgeted period is 12 weeks of 5 days each =60 days.

$$\text{Product A} = \frac{5,000 \times 12}{60} = 1,000 \text{ units}$$

$$\text{Product B} = \frac{10,000 \times 18}{60} = 3,000 \text{ units}$$

#### (iii) Wages budget for direct workers

	<i>Product A (hrs)</i>	<i>Product B (hrs)</i>	<i>Total (hrs.)</i>
Standard hours (budgeted)			
5,200 units (A) × 4 hours per unit and 11,320 units (B) × 3 hours per unit.	20,800	33,960	54,760
Standard hours at 80% efficiency ratio			68,450
Add: non productive time (20% of 68,450)			13,690
			82,140
Labour hours required (150 workers × 8 hours per day × 60 days)			72,000
Overtime			10,140

Wages for normal hours (72,000 × 8) = ₹ 5,76,000

Wages for overtime (10,140 × 8 × 1.5) = ₹ 1,21,680

Total wages = ₹ 6,97,680

**Question 2**

*A company manufactures two products X and Y. Product X requires 8 hours to produce while Y requires 12 hours. In April, 2004, of 22 effective working days of 8 hours a day, 1,200 units of X and 800 units of Y were produced. The company employs 100 workers in production department to produce X and Y. The budgeted hours are 1,86,000 for the year.*

*Calculate Capacity, Activity and Efficiency ratio and establish their relationship.*

*(6 Marks)(Nov. 2004)*

**Answer**

*Standard hours produced*

	<i>Product X</i>	<i>Product Y</i>	<i>Total</i>
Out put (units)	1,200	800	
Hours per unit	8	12	
Standard hours	9,600	9,600	19,200

**Actual hours worked**

$$100 \text{ workers} \times 8 \text{ hours} \times 22 \text{ days} = 17,600$$

**Budgeted hours per month**

$$1,86,000/12 = 15,500$$

$$\text{Capacity Ratio} = \frac{\text{actual hours}}{\text{Budgeted hours}} \times 100 = \frac{17,600}{15,500} = 113.55 \%$$

$$\text{Efficiency Ratio} = \frac{\text{Standard Hours Produced}}{\text{Actual hours}} \times 100 = \frac{19,200}{17,600} \times 100 = 109.09\%$$

$$\text{Activity Ratio} = \frac{\text{Standard Hours Produced}}{\text{Budget hours}} \times 100 = \frac{19,200}{15,500} \times 100 = 123.87\%$$

Relationship : Activity Ratio = Efficiency Ratio × Capacity Ratio

$$\text{or } 123.87 = \frac{109.09 \times 113.55}{100}$$

**Question 3**

*“Because a single budget system is normally used to serve several purposes, there is a danger that they may conflict with each other”. Do you agree? Discuss.*

*(4 Marks)(May 2005)*

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##### Answer

A single budget system may be conflicting in planning and motivation, and planning and performance evaluation roles as below:

- (i) Planning and motivation roles – Demanding budgets that may not be achieved may be appropriate to motivate maximum performance but they are unsuitable for planning purposes. For these, a budget should be a set based on easier targets that are expected to be met.
- (ii) Planning and performance evaluation roles - For planning purposes budgets are set in advance of the budget period based on an anticipated set of circumstances or environment. Performance evaluation should be based on a comparison of active performance with an adjusted budget to reflect the circumstance under which managers actually operated.

##### Question 4

*A Company is engaged in manufacturing two products 'X' and 'Y'. Product X uses one unit of component 'P' and two units of component 'Q'. Product 'Y' uses two units of component 'P', one unit of component 'Q' and two units of component 'R'. Component 'R' which is assembled in the factory uses one unit of component 'Q'.*

*Component 'P' and 'Q' are purchased from the market. The company has prepared the following forecast of sales and inventory for the next year:*

	<i>Product 'X'</i>	<i>Product 'Y'</i>
<i>Sales (in units)</i>	<i>80,000</i>	<i>1,50,000</i>
<i>At the end of the year</i>	<i>10,000</i>	<i>20,000</i>
<i>At the beginning of the year</i>	<i>30,000</i>	<i>50,000</i>

*The production of both the products and the assembling of the component 'R' will be spread out uniformly throughout the year. The company at present orders its inventory of 'P' and 'Q' in quantities equivalent to 3 months production. The company has compiled the following data related to two components:*

	<i>P</i>	<i>Q</i>
<i>Price per unit (₹)</i>	<i>20</i>	<i>8</i>
<i>Order placing cost per order (₹)</i>	<i>1,500</i>	<i>1,500</i>
<i>Carrying cost per annum</i>	<i>20%</i>	<i>20%</i>

*Required:*

- (a) Prepare a Budget of production and requirements of components during next year.*
- (b) Suggest the optimal order quantity of components 'P' and 'Q'. (11 Marks)(May 2006)*

Answer

(a) Production Budget for product X and Y

	X units	Y units
Inventory at the end of the year	10,000	20,000
Sales forecast	80,000	1,50,000
Total requirements	90,000	1,70,000
Less: Beginning inventory	30,000	50,000
Production	60,000	1,20,000

Budgeted requirements of components P, Q and R

Components	P	Q	R
For Product X: Production 60,000 units			
P: 60,000 × 1 per unit	60,000		
Q: 60,000 × 2 per unit		1,20,000	
For Product Y: Production 1,20,000 units			
P: 1,20,000 × 2 per unit	2,40,000		
Q: 1,20,000 × 1 per unit		1,20,000	
R: 1,20,000 × 2 per unit			2,40,000
For comp R: Production 2,40,000 comp			
Q: 2,40,000 × 1 per component R		2,40,000	
Total requirements	3,00,000	4,80,000	2,40,000

(b) The company is advised to adopt EOQ system.

P	Q
EOQ $\sqrt{\frac{2 \times 3,00,000 \times 1,500}{20 \times 20\%}} = 15,000$ components	$\sqrt{\frac{2 \times 4,80,000 \times 1,500}{8 \times 20\%}} = 30,000$ components

Question 5

Describe the process of zero-base budgeting.

(4 Marks)(May, 2007)

Answer

The zero Base Budgeting involves the following steps:

- (i) Corporate objectives should be established and laid down in details.
- (ii) Decide about the techniques of ZBB to be applied.
- (iii) Identify those areas where decisions are required to be taken.

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- (iv) Develop decision programmes and rank them in order of preferences.
- (v) Preparation of budget, that is translating decision packages into practicable units/items and allocating financial resources.

#### Question 6

What do you mean by a flexible budget? Give an example of an industry where this type of budget is typically needed?  
(2 Marks) (May 2008)

#### Answer

A flexible budget is a budget which, by recognizing the difference between fixed, semi-variable and variable costs, is designed to change in relation to the level of activity attained.

E.g. seasonal products – e.g. soft drink industry

industries in make to order business like ship building

industries influenced by change in fashion.

Industries which keep on introducing new products / new designs.

#### Question 7

The budgeted and actual cost data of M Ltd. for 6 months from April to September, 2008 are as under:

	<i>Budget</i>	<i>Actual</i>
<i>Production units</i>	16,000	14,000
<i>Material cost</i>	₹ 25,60,000 (1,600 MT @ ₹ 1,600)	₹ 41,60,000 (at ₹ 1,650)
<i>Labour cost</i>	₹ 16,00,000 (at ₹ 40 per hour)	₹ 15,99,840 (@ ₹ 44 per hour)
<i>Variable overhead</i>	₹ 3,00,000	₹ 2,76,000
<i>Fixed overhead</i>	₹ 4,60,000	₹ 5,80,000

In the first half of financial year 2009-10, production is budgeted for 30,000 units, material cost per tonne will increase from last year's actual by ₹ 150, but it is proposed to maintain the consumption efficiency of 2008 as budgeted. Labour efficiency will be lower by 1% and labour rate will be ₹ 44 per hour. Variable and fixed overheads will go up by 20% over 2008 actuals.

Prepare the Production Cost budget for the period April-September, 2009 giving all the workings.  
(6 Marks)(Nov., 2008)

Answer

Production Cost Budget  
(for 6 months ending 30th September, 2009)

	<i>30,000 units</i>	
	<i>Cost per unit</i>	<i>Total</i>
	₹	₹
Material cost	180	54,00,000
Labour cost	115.21	34,56,420
Variable overhead	23.65	7,09,500
Fixed overhead	<u>23.2</u>	<u>6,96,000</u>
	<u>342.06</u>	<u>1,02,61,920</u>

Assumption: Here, difference in actual and standard time is also considered for calculating the lower efficiency i.e. 3.74% + 1% = 4.74%

Working Notes:

I. Material cost

$$\text{Material consumption per unit} = \frac{1,600 \text{ MT}}{16,000} = 0.10 \text{ MT}$$

Consumption for 30,000 units = 3,000 MT.

Cost of 3,000 MT @ ₹ 1,800 per MT = ₹ 54,00,000.

II. Labour cost can be calculated as follows:

Time required for 30,000 units = 75,000 hours

Add: \*(3.74% + 1%) = 4.74% for lower efficiency = 3,555 hours= 78,555 hours

$$*3.74\% = \frac{\text{Difference in actual and standard hours}}{\text{Actual hours}} \times 100$$

$$= \frac{1,360 \text{ hours}}{36,360 \text{ hours}}$$

Labour cost = 78,555 hours × 44 per hour

= 34,56,420.

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### III. Variable overhead

$$\text{Actual rate} = \frac{\text{₹ } 2,76,000}{14,000} = 19.71 \text{ per unit}$$

$$\text{Add: 20} = \underline{3.94}$$

$$\text{New rate} = \underline{23.65}$$

$$\begin{aligned} \text{Total variable overhead} &= 30,000 \times 23.65 \\ &= \text{₹ } 7,09,500 \end{aligned}$$

### IV. Fixed overhead

$$\text{Actual} = \text{₹ } 5,80,000$$

$$\text{Add: 20\%} = \text{₹ } \underline{1,16,000}$$

$$= \text{₹ } \underline{6,96,000}$$

According to above the production cost budget will be as follows:

Alternative

### Production Cost Budget (for 6 months ending 30th September, 2009)

	30,000 units	
	Cost per unit	Total
	₹	₹
Material cost	180	54,00,000
Labour cost	111.1	33,33,000
Variable overhead	23.65	7,09,500
Fixed overhead	<u>23.2</u>	<u>6,96,000</u>
	<u>337.95</u>	<u>1,01,38,500</u>

Working Notes:

#### I. Material cost

$$\text{Material consumption per unit} = \frac{1,600 \text{ MT}}{16,000} = 0.10 \text{ MT}$$

$$\text{Consumption for 30,000 units} = 3,000 \text{ MT.}$$

$$\text{Cost of 3,000 MT @ ₹ } 1,800 \text{ per MT} = \text{₹ } 54,00,000.$$

## II. Labour Cost:

$$2008 - \text{Total Budgeted Hour} = \frac{16,00,000}{40} = 40,000 \text{ hours}$$

$$\text{Labour hour budget for each unit} = \frac{40,000}{16,000} = 2.5$$

$$\text{Actual time paid} = \frac{15,99,840}{44} = 36,360 \text{ hours}$$

*Less:* Standard labour hours for 14,000 units (i.e.  $14,000 \times 2.5$ ) = 35,000 hours

$$\text{Difference in actual and standard hours} = \underline{1,360}$$

$$\text{Time required for 30,000 units (30,000} \times 2.5) = 75,000 \text{ hours}$$

$$\text{Add: 1\% for lower efficiency} = \underline{750 \text{ hours}}$$

$$= \underline{75,750 \text{ hours}}$$

$$\text{Labour cost} = 75,750 \text{ hours} \times 44 \text{ per hour} = 33,33,000$$

## III. Variable overhead

$$\text{Actual rate} = \frac{\text{₹ } 2,76,000}{14,000 \text{ units}} = 19.71 \text{ per unit}$$

$$\text{Add: 20} = \underline{3.94}$$

$$\text{New rate} = \underline{23.65}$$

$$\text{Total variable overhead} = 30,000 \times 23.65 = \text{₹ } 7,09,500$$

## IV. Fixed overhead

$$\text{Actual} = \text{₹ } 5,80,000$$

$$\text{Add: 20\%} = \text{₹ } \underline{1,16,000}$$

$$= \text{₹ } \underline{6,96,000}$$

## Question 8

*What are the various formulae used in calculating budget ratios? (3 Marks)(June, 2009)*

Answer

Type of budgeted ratio used are:

1. Efficiency Ratio =  $(\text{Standard hours} + \text{Actual hours}) \times 100$
2. Activity Ratio =  $(\text{Standard hours} + \text{Budgeted hours}) \times 100$
3. Calendar Ratio =  $(\text{Available working days} \div \text{budgeted working days}) \times 100$

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- Standard Capacity Usage Ratio (Budgeted hours ÷ Max. possible hours in the budgeted period) × 100
- Actual Capacity Usage Ratio = (Actual hours worked ÷ Maximum possible working hours in a period) × 100
- Actual usage of Budgeted Capacity Ratio = (Actual working hours ÷ Budgeted hours) × 100

#### Question 9

*What are the steps involved in Zero-base budgeting?*

*(5 Marks)(Nov.,2010)*

#### Answer

Steps involved in the process of Zero Based Budgeting:

- Determination of a set of objects is the pre-requisite and essential step in the direction of ZBB technique.
- Deciding about the extent to which the technique of ZBB is to be applied whether in all areas of organization activities or only in few selected areas on trial basis.
- Identify the areas where decisions are required to be taken.
- Developing decision packages and ranking them in order of performance.
- Preparation of budget that is translating decision packages into practicable units/items and allocating financial resources.

ZBB is simply an extension of the cost, benefit analysis method to the area of corporate planning and budgeting.

#### Question 10

*The CEO of your company has been given the following statement showing the results for a recent month:*

<i>Particulars</i>	<i>Master Budget</i>	<i>Actual</i>
<i>Units produced &amp; sold</i>	<i>10,000</i>	<i>9,000</i>
	<i>₹</i>	<i>₹</i>
<i>Sales</i>	<i>8,00,000</i>	<i>7,00,000</i>
<i>Direct material</i>	<i>2,00,000</i>	<i>1,84,000</i>
<i>Direct Wages</i>	<i>3,00,000</i>	<i>2,62,000</i>
<i>Variable overhead</i>	<i>1,00,000</i>	<i>94,000</i>
<i>Fixed overhead</i>	<i>1,00,000</i>	<i>98,000</i>
<i>Total Cost</i>	<i>7,00,000</i>	<i>6,38,000</i>
<i>Net Surplus</i>	<i>1,00,000</i>	<i>62,000</i>

The standard cost of the product is as follows:

Direct material (1 kg @ ₹ 20/kg) ₹ 20.00 per unit

Direct Wages (1 hour @ ₹ 30/hour) ₹ 30.00 per unit

Variable overhead (1 hour @ ₹ 10/hour) ₹ 10.00 per unit

Actual results for the month revealed that 9,800 kg. of material was used and 8,800 labour hours were recorded.

(i) Prepare a flexible budget for the month and compare with the actual results. (6 Marks)

(ii) Calculate material volume and variable overhead efficiency variances. (2 Marks)

Answer

(i)

Particular	Master Budget		Flexible Budget	Actual	Variance	
	Units					
Units	10,000		9,000	9,000		
	(₹)Total	(₹) Per Unit	(₹)	(₹)		
Sales	8,00,000	80	7,20,000	7,00,000	20,000	(A)
Direct Material	2,00,000	20	1,80,000	1,84,000	4,000	(A)
Direct Wages	3,00,000	30	2,70,000	2,62,000	8,000	(F)
Variable Overhead	1,00,000	10	90,000	94,000	4,000	(A)
Total Variable Cost	6,00,000	60	5,40,000	5,40,000	-	
Contribution	2,00,000	20	1,80,000	1,60,000	20,000	(A)
Fixed Overhead	1,00,000	10	1,00,000	98,000	2,000	(F)
Net Profit	1,00,000	10	80,000	62,000	18,000	(A)

(ii) Calculation of Variances:

Material Volume Variance:  $SP (SQ - AQ) = 20 (9,000 - 9,800) = 16,000 (A)$

Variable Overhead efficiency variance  $SR (SH - AH) = 10 (9,000 - 8,800) = 2,000 (F)$

Question 11

A Company is engaged in manufacturing two products A and B. Product A uses one unit of component X and two units of component Y. Product B uses two units of component X and one unit of component Y and two units of component Z. Component Z which is assembled in the factory uses one unit of component Y.

Components X and Y are purchased from the market. The company has prepared the following forecast of sales and inventory for the next year:

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	Product A	Product B
	(Units)	(Units)
Sales	80,000	1,50,000
Stock at the end of the year	10,000	20,000
Stock at the beginning of the year	30,000	50,000

The production of both the products and the assembling of the component Z will be spread out uniformly throughout the year. The company at present orders its inventory of X and Y in quantities equivalent to 3 months production. The company has compiled the following data related to the two components:

	X	Y
Price per unit (₹)	20	8
Order placing cost per order (₹)	1,500	1,500
Carrying cost per annum	20%	20%

Required:

- Prepare a budget for production and requirements of components for the next year.
- Suggest the optimal order quantity of components X and Y. (7 Marks)(May, 2010)

Answer

- Production Budget

	Product "A"	Product "B"
	Units	Units
Sales	80000	150000
Closing stock	10000	20000
Opening stock	30000	50000
Production Budget	60000	120000

#### Budget of Component Requirements

Components	X	Y	Z
Product A: Production 60000 units	60000	120000	
Product B: Production 120000 units	240000	120000	240000
Component Z : 240000 units		240000	
Total	300000	480000	240000

(ii) Optimal order quantity of components X and Y

Components	X	Y
Order placing costs ₹	1500	1500
Price of the component ₹	20	8
Carrying cost @ 20% ₹	4	1.60

$$EOQ = \sqrt{\left(\frac{(2 * 300000 * 1500)}{4}\right)} \qquad \sqrt{\left(\frac{(2 * 480000 * 1500)}{1.60}\right)}$$

= 15000 components                      = 30000 components

**Question 12**

*PQR Ltd is considering introducing a new product at a price of ₹ 105 per unit. 'PQR Ltd's controller has compiled the following incremental cost information based on an estimate of 1,20,000 units of sales annually for the new product:*

<i>Direct material cost</i>	<i>₹ 36,00,000</i>
<i>Direct Labour cost</i>	<i>₹ 24,00,000</i>
<i>Flexible manufacturing support</i>	<i>₹ 12,00,000</i>
<i>Sales commission</i>	<i>10% of sales</i>
<i>Capacity- related cost</i>	<i>₹ 20,00,000</i>

*The average inventory levels for the new product are estimated as follows:*

*Raw materials: 2 months' production*

*Work-in-progress (100% complete for*

*Materials and 50% complete for labour and*

*Flexible manufacturing support) 1 month production*

*Finished goods 2 months' production*

*Annual inventory carrying costs not included in the flexible manufacturing support listed earlier are estimated to be 12% of inventory value. In addition, the sales manager expects the introduction of new product to result in a reduction in sales of existing product from 3,00,000 to 2,40,000 units. The contribution margin for the existing product is ₹20 per unit.*

*Prepare a statement showing the budgeted impact on PQR's profits on the introduction of the new product. Should the new product be introduced? (8 Marks)(May, 2012)*

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Answer

Budgeted production = 120,000 per annum (10,000 units per month)		
	₹ per unit	Total ₹
Sales Value	105.00	1,26,00,000
Less: Variable Cost		
Direct material	30.00	36,00,000
Direct Labour	20.00	24,00,000
Flexible mfg. support	10.00	12,00,000
Commission 10% of sales	10.50	12,60,000
Total Variable Cost	70.50	84,60,000
Contribution	34.50	41,40,000
Fixed mfg. cost (Capacity related cost)		20,00,000
Inventory carrying cost (Refer working)		2,70,000
Profit from new product		18,70,000
Less: Loss of contribution due to lower sale of existing product 60,000 units * ₹20		12,00,000
Net incremental profit		6,70,000

( Decision: Recommend new product)

Value of Inventory

Raw materials (36,00,000 /6)		6,00,000
Work in progress		
Materials (36,00,000/ 12)	3,00,000	
Labour (24,00,000/ 24)	1,00,000	
Flexible Manufacturing support (12,00,000 / 24)	50,000	4,50,000
Finished Goods		
(Raw materials + Labour + Flexible manufacturing support) / 6		12,00,000
Total Inventory Value		22,50,000
Inventory Carrying cost - 12%		2,70,000

Question 13

Define the following:

(i) maximum capacity (theoretical capacity)

(ii) *practical capacity*

(iii) *normal capacity*

(iv) *principal budget factor*

*(The first three relate to a manufacturing plant)*

*(4 Marks)(May, 2012)*

**Answer**

(i) Maximum Capacity = Maximum no. of days in a period x no. of workers or  
Maximum no. of hours x no. of workers

or

The maximum no. of units that can be produced by a manufacturing facility in a certain period.

(ii) Practical Capacity = Maximum capacity (minus) Sundays, holidays, normal maintenance & idle time

(iii) Normal Capacity = Average of past 3 years' normal performance excluding abnormal data.

(iv) Principal budget factor = The factor that limits the activities of the functional budgets of the organization.

**Question 14**

*Discuss the characteristics of zero base budgeting.*

*(4 Marks)(Nov, 2012)*

**Answer**

Zero base budgeting (ZBB) is defined as method of budgeting which requires each cost element to be specifically justified, as though the activities to which the budget relates were being undertaken for the first time. ZBB is prepared and justified from scratch (zero). Without approval, the budget allowance is zero.

Characteristics of ZBB:

(i) Manager of a decision unit has to completely justify why there should be any budget allotment for his decision unit.

(ii) Activities are identified in decision packages.

(iii) Decision packages are ranked in order of priority

(iv) Packages are evaluated by systematic analysis.

(v) Decision packages are linked with corporate objectives, which are clearly laid down.

(vi) Available resources are directed towards alternatives in order to prioritize to ensure optimal results.

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##### Question 15

*KG Ltd. is engaged in the production of two products K and G. One unit of product K requires two units of material A and four units of material B. Each unit of product G needs four units of material A, two units of material B and four units of material C. Material C is locally produced in the factory of the company by using two units of material B for each unit of C.*

*Material A and B are purchased in the open market. Production of products K, G and C is carried out evenly throughout the year. At present the company has purchased its 3 months requirements of A and B in one purchase. That is four purchases per annum. The other particulars provided by the company are:*

	Products	
	K Units	G Units
Budgeted sales for the next year	40,000	75,000
Desired stock at the end of the year	5,000	10,000
Expected stock at the beginning of the year	15,000	25,000
	Products	
	A	B
Purchase price p.u. (₹)	15	25
Ordering cost per order (₹)	1,000	1,000
Carrying cost p.a.	10%	10%

You are required to:

- (i) Prepare a production budget and a material requirement budget for the next year.
- (ii) Calculate the number of material purchases to be made, if the company wants to purchase materials in optimal quantity. **(8 Marks)(May, 2013)**

Answer

##### Production Budget for Product K and G

Particulars	'K' Units	'G' Units
Desired Inventory <i>at the end of the year</i>	5,000	10,000
Sales Forecast	<u>40,000</u>	<u>75,000</u>
Total Requirements	45,000	85,000
Less: Expected Inventory <i>at beginning of the year</i>	<u>15,000</u>	<u>25,000</u>
Budgeted Production	30,000	60,000

## Budgeted Requirements of Material 'A', 'B' and 'C'

Particulars	'A' Units	'B' Units	'C' Units
For Product 'K': Production 30,000 units			
'A': 30,000 × 2 per unit	60,000	-	-
'B': 30,000 × 4 per unit	-	1,20,000	-
For Product 'G': Production 60,000 units			
'A': 60,000 × 4 per unit	2,40,000	-	-
'B': 60,000 × 2 per unit	-	1,20,000	-
'C': 60,000 × 4 per unit	-	-	2,40,000
For Material 'C': Production 2,40,000 units			
'B': 2,40,000 × 2 per unit	-	4,80,000	-
Total Requirements	3,00,000	7,20,000	2,40,000

Optimum Order Quantity:

A	B
$EOQ = \sqrt{\frac{2 \times 3,00,000 \times 1,000}{15 \times 10\%}} = 20,000 \text{ Units}$	$EOQ = \sqrt{\frac{2 \times 7,20,000 \times 1,000}{25 \times 10\%}} = 24,000 \text{ Units}$

No. of Purchases:

A	B
$= \frac{\text{Total Requirements}}{\text{Optimum Order Quantity}} = \frac{3,00,000}{20,000}$	$= \frac{\text{Total Requirements}}{\text{Optimum Order Quantity}} = \frac{7,20,000}{24,000}$
= 15 Purchases	= 30 Purchases

## Question 16

The PLN Co. presents the following static budgets for 4,000 units and 6,000 units activity levels for October 2013:

	4,000 units activity level	6,000 units activity level
Overhead A ` 12/hr. x 2 hr. /unit	96,000	1,44,000
Overhead B	1,40,000	1,90,000

Overhead C was omitted to be listed out. It is a fixed plant overhead, estimated at ₹ 12.5/hr. at 4,000 units activity level. This has to also feature in the flexible budget. The actual production was 5,000 units and 9,600 hours were needed for production.

#### 4.19 Advanced Management Accounting

You are required to present the flexible budget amount of each overhead to enable appropriate comparison with the actual figures. (5 Marks)(Nov, 2013)

Answer

Statement Showing Flexible Budget for 5,000 units Activity Level

Particulars	Amount (₹)
Overhead A (₹12.00 per hour × 2 hrs. per unit × 5,000 units)	1,20,000
Overhead B* (₹ 40,000 + ₹25 × 5,000 units)	1,65,000
Overhead C (₹12.50 per hour × 2 hrs. per unit × 4,000 units)	1,00,000
Total	3,85,000

Working Note (\*)

Overhead B

$$\begin{aligned}
 \text{Variable Cost (per unit)} &= \frac{\text{Change in Overhead Cost}}{\text{Change in Production Units}} \\
 &= \frac{\text{₹ 1,90,000} - \text{₹ 1,40,000}}{6,000 \text{ units} - 4,000 \text{ units}} \\
 &= \frac{\text{₹ 50,000}}{2,000 \text{ units}} \\
 &= \text{₹ 25} \\
 \text{Fixed Cost} &= \text{₹ 1,40,000} - 4,000 \text{ units} \times \text{₹ 25} \\
 &= \text{₹ 40,000}
 \end{aligned}$$

Question 17

In each of the following independent situations, state with a brief reason whether 'Zero Base Budgeting' (ZBB) or 'Traditional Budgeting' (TB) would be more appropriate for year II.

- (i) A company producing a certain product has done extensive ZBB exercise in year I. The activity level is expected to marginally increase in year II.
- (ii) The sales manager of a company selling three products has the intuitive feeling that in year II, sales will increase for one product and decrease for the other two. His expectation cannot be substantiated with figures.
- (iii) The top management would like to delegate responsibility to the functional managers for their results during year II.
- (iv) Resources are heavily constrained and allocation for budget requirements is very strict.

(4 Marks)(Nov, 2013)

## Answer

- (i) The company has done extensive exercise in year-I that can be used as a basis for budgeting in year-II by incorporating increase in costs / revenue at expected activity level. Hence, Traditional Budgeting would be more appropriate for the company in year-II.
- (ii) In Traditional Budgeting system budgets are prepared on the basis of previous year's budget figures with expected change in activity level and corresponding adjustment in the cost and prices. But under Zero Base Budgeting (ZBB) the estimations or projections are converted into figures. Since, sales manager is unable to substantiate his expectations into figures so Traditional Budgeting would be preferred against Zero Base Budgeting.
- (iii) Zero Base Budgeting would be appropriate as ZBB allows top-level strategic goals to be implemented into the budgeting process by tying them to specific functional areas of the organization, where costs can be first grouped, then measured against previous results and current expectations.
- (iv) Zero Base Budgeting allocates resources based on order of priority up to the spending cut-off level (maximum level upto which spending can be made). In an organisation where resources are constrained and budget is allocated on requirement basis, Zero Base Budgeting is more appropriate method of budgeting.

## Question 18

DEF Ltd manufactures and sells a single product and has estimated sales revenue of ₹ 397.80 lacs during the year based on 20% profit on selling price. Each unit of product requires 6 kg of material A and 3 kg of material B and processing time of 4 hours in machine shop and 2 hours in assembly shop. Factory overheads are absorbed at a blanket rate of 20% of direct labour. Variable selling & distribution overheads are ₹ 6 per unit sold and fixed selling & distribution overheads are estimated to be ₹ 7,20,000.

The other relevant details are as under:

Purchase Price	Material A	₹ 16 per kg	
	Materials B	₹ 10 per kg	
Labour Rate	Machine Shop	₹ 14 per hour	
	Assembly Shop	₹ 7 per hour	
	<b>Finished Stock</b>	<b>Material A</b>	<b>Material B</b>
Opening Stock	25,000 units	75,000 kg	40,000 kg
Closing Stock	30,000 units	80,000 kg	55,000 kg

You are required to calculate:

- (i) Number of units of product proposed to be sold and selling price per unit.
- (ii) Production budget in units.
- (iii) Material purchase budget in units.

(7 Marks) (May, 2014)

4.21 Advanced Management Accounting

Answer

(i) Workings:

Statement Showing Total Variable Cost *for the year*

Particulars	Amount (₹)
Estimated Sales Revenue	3,97,80,000
Less: Desired Profit Margin on Sale @ 20%	79,56,000
Estimated Total Cost	3,18,24,000
Less: Fixed Selling and Distribution Overheads	7,20,000
Total Variable Cost	3,11,04,000

Statement Showing Variable Cost per unit

Particulars	Variable Cost p.u. (₹)
Direct Materials:	
A: 6 Kg. @ ₹16 per Kg.	96
B: 3 Kg. @ ₹10 per Kg.	30
Labour Cost:	
Machine Shop: 4 hrs. @ ₹14 per hour	56
Assembly Shop: 2 hrs. @ ₹7 per hour	14
Factory Overheads: 20% of (₹56 + ₹14)	14
Variable Selling & Distribution Expenses	6
Total Variable Cost <i>per unit</i>	216

$$\begin{aligned} \text{Number of Units Sold} &= \text{Total Variable Cost} / \text{Variable Cost per unit} \\ &= ₹3,11,04,000 / ₹216 \\ &= 1,44,000 \text{ units} \end{aligned}$$

$$\begin{aligned} \text{Selling Price per unit} &= \text{Total Sales Value} / \text{Number of Units Sold} \\ &= ₹3,97,80,000 / 1,44,000 \text{ units} = ₹276.25 \end{aligned}$$

(ii) Production Budget (units)

Particulars	Units
Budgeted Sales	1,44,000
Add: Closing Stock	30,000
Total Requirements	1,74,000
Less: Opening Stock	25,000
Required Production	1,49,000

## (iii) Materials Purchase Budget (Kg.)

Particulars	Material A	Material B
Requirement for Production	8,94,000 (1,49,000 units × 6 Kg.)	4,47,000 (1,49,000 units × 3 Kg.)
Add: Desired Closing Stock	80,000	55,000
Total Requirements	9,74,000	5,02,000
Less: Opening Stock	75,000	40,000
Quantity to be purchased	8,99,000	4,62,000

## Question 19

The following are the details regarding budgeted and actual production costs for the year 2013 of an industrial concern. You are required to prepare a Production Cost Budget for the year 2014.

	Budget		Actual	
Output (units)	39,900		40,600	
	Units		Units	
Materials consumed	42,000	42,000	43,000	53,750
Wages at 1 hour per unit at ₹ 1 per unit Budget	---	39,900	---	44,660
Variable Overhead at ₹1 per unit Budget	---	19,950	---	20,600
Fixed Overheads	---	30,000	---	35,000
		1,31,850		1,54,010

During the budget period:

- (1) Production is expected to reach 50,000 units,
- (2) Material price are expected to increase further by the same percentage as they had increased over the budget period.
- (3) Labour rates are expected to increase by ₹ 0.20 per hour above the actual rates shown above; efficiency is expected to decline by 10%; upto 31<sup>st</sup> December, 2013, there has been no decline in efficiency.
- (4) Variable overhead of previous year to be maintained.
- (5) Fixed overheads are expected to rise by 10% per annum.
- (6) Wastage of materials to be maintained at 2013 budget level.

(6 Marks) (November, 2014)

Answer

## Preparation of Production Cost Budget for 50,000 units for the year 2014

Particulars	Cost Per Unit	Total Amount (₹)
Materials (W.N.-1)	1.645	82,237.50
Wages (W.N.-2)	1.43	71,500.00
Variable Overhead	0.50	25,000.00
Fixed Overhead (₹35,000 × 110%)	0.77	38,500.00
Total Cost	4.345 (Approx.)	2,17,237.50



Fixed Overhead can also be calculated on the basis of previous year's budgeted figure. Variable Overhead may also be calculated by taking ₹ 1 per unit. This question can also be solve by taking 50,000 hrs. as 90% of total hrs. required to produce the 50,000 units.

## Working Notes

## 1. Material Cost-

(a) Increase in Material Price in the Year 2013-

$$= \frac{\text{Actual Cost per unit in 2013} - \text{Budgeted Cost per unit in 2013}}{\text{Budgeted Cost per unit in 2013}} \times 100$$

$$= \frac{\left( \frac{\text{₹ 53,750}}{43,000 \text{ units}} \right) - \text{₹ 1}}{\text{₹ 1}} \times 100$$

$$= 25\%$$

(b) Material Required to Produce 50,000 units-

$$= \frac{42,000 \text{ units}}{39,900 \text{ units}} \times 50,000 \text{ units}$$

$$= 52,632 \text{ units (rounded)}$$

(c) Increased Cost for 50,000 units in the Year 2014-

$$= \frac{\text{₹ 53,750}}{43,000 \text{ units}} \times 125\% \times 52,632 \text{ units}$$

$$= \text{₹ 82,237.50}$$

## 2. Wages-

(a) Rate *per hour* in 2014-

$$= \frac{\text{Wages Paid in the Year 2013}}{\text{Actual Units Produced}} + ₹0.20$$

$$= \frac{₹44,660}{40,600 \text{ units}} + ₹0.20$$

$$= ₹1.30$$

(b) Wages to be paid for 50,000 units i.e. for 50,000 hours (1 hour per unit). When the labour efficiency is 90% only, then Total Wages will be-

$$= \left( 50,000 \text{ hours} \times \frac{110}{100} \right) \times ₹1.30$$

$$= ₹71,500$$