SUGGESTED SOLUTIONS

KB 2 – Business Management Accounting

June 2019

SECTION 1

Answer 01

Relevant learning outcome/s: 1.2.2
Evaluate the use of marginal costing and throughput accounting in stock valuation, profit calculation, and limiting factor (bottleneck resource) decision-making.
Study text reference: Pages 61, 66 – 68

(a)

Moulding machine	**Domestic**	**Industrial**
Time utilisation (minutes)	2	5
Expected demand per month (units)	800	2,500
Time required to meet the expected demand (minutes)	1,600	12,500
Total time (minutes)		14,100
Available time (300 hours) in minutes		18,000
Not a bottleneck resource		
Cutting machine	**Domestic**	**Industrial**
Time utilisation (minutes)	9	25
Expected demand per month (units)	800	2,500
Time required to meet the expected demand (minutes)	7,200	62,500
Total time (minutes)		69,700
Available time (300 hours) in minutes		18,000
Will be a bottleneck resource		

(b)

	Domestic	Industrial
Selling price (Rs.)	50,000	200,000
Variable cost (Rs.)		
- Material	13,000	80,000
- Labour	10,000	50,000
Total variable cost (Rs.)	23,000	130,000
Contribution (Rs.)	27,000	70,000
Limiting factor: Cutting machine time utilisation per unit (minutes)	9	25
Contribution per minute (Rs.)	3,000	2,800
Ranking	*1*	*2*
Production plan (units)	750	450
Utilisation of cutting machine time (18,000 minutes)	6,750	11,250
Contribution (Rs.)	20,250,000	31,500,000
Fixed production cost (Rs.)		(21,750,000)
Expected net profit (Rs.)		30,000,000

(c)

	Domestic	Industrial
Selling price (Rs.)	50,000	200,000
Material cost (Rs.)	(13,000)	(80,000)
Contribution per unit	37,000	120,000
Limiting factor: Cutting machine time utilisation per unit (minutes)	9	25
Throughput contribution per minute (Rs.)	4,111	4,800
Throughput accounting ratio	4,111.11/2,875	4,800/2,875
Throughput accounting ratio	1.43	1.67
Ranking	*2*	*1*
Production plan (units)	500	540
Utilisation of cutting machine time (18,000 minutes)	4,500	13,500
Throughput profit (Rs.)	18,500,000	64,800,000
Conversion cost (Rs.)		(51,750,000)
Net profit (Rs.)		31,550,000
Computation of conversion cost (Rs.)		
Labour cost		30,000,000
Fixed production cost		21,750,000
Total conversion cost		51,750,000
Cost per cutting machine minute (Rs. 51.75 million/18,000 minutes)		2,875

According to the above, it can be concluded that the finance manager's argument is valid.

(Total: 10 marks)

Answer 02

(a)

Cost driver		Clothing items	Electronic items	Furniture items	Total
No. of pallets delivered		600	120	80	**800**
No. of customers		20,000	12,000	8,000	**40,000**
No. of inventory items		1,000	100	30	**1,130**
Cost pool	**Cost driver**	**Actual overhead cost (Rs.)**	**Expected increase in overhead cost**	**Overhead cost for 2019 (Rs.)**	**Budgeted cost per cost driver (Rs.)**
Warehouse receiving	No. of pallets	9,000,000	10%	9,900,000	12,375
Customer service	No. of customers	6,000,000	5%	6,300,000	157.5
In-store merchandising	No. of inventory items	6,328,000	12%	7,087,360	6,272
		21,328,000			
		Clothing items (Rs.)			
No. of pallets delivered		7,425,000			
No. of customers		3,150,000			
No. of inventory items		6,272,000			
		16,847,000			

(b)   Activity-based management (ABM)/operational ABM involves actions being based on activity driver analysis, which increases efficiency, lowers costs and improves asset utilisation. It uses the information generated by activity-based costing to control or reduce cost drivers, and also reduce overheads. By doing so, the company can gain a competitive advantage by lowering costs and increasing efficiency, which will ultimately lead to an increase in profitability.

Analysing costs by activity provides much more relevant information to managers. For example, APL could see how fair the cost of Rs. 12,375 is in receiving a pallet of goods by comparing it with market peers, industry benchmarks and norms. There may also be activities that are being performed that do not add value, and these can be stopped. The management may also identify activities that cost more than expected, and then investigate these. Further studies could find measures to cut down these costs. Likewise the company can carry out a thorough study in order to find out ways and means of controlling costs.

(c)   Working capital management involves managing current assets (inventories, accounts receivable etc.) and current liabilities (accounts payable, short term borrowings etc.) in a proper way in order to minimise the cost involved in working capital investment and ensure operations of the company are carried out smoothly.

Proper working capital management reduces the cost of inventory and accounts receivable. Short term borrowings will be taken at the correct time. It ensures better management of inventory and a continuous supply of material/stocks for production/operations, which will lead to minimum production stoppages and stock-out situations. All of this will increase the profitability of the company.

(Total: 10 marks)

Answer 03

Option (a)

	Rs.
Current variable cost per impeller	800
Price in external market	1,600
Loss in contribution per unit of water pump	(800)
Loss in contribution for 12,000 units	(9,600,000)
Savings in avoidable fixed costs (200 * 12,000 * 80%)	1,920,000
Decrease in current profit up to 12,000 units	(7,680,000)
Additional contribution from selling additional 4,000 units	
Contribution per pump (2,000 – 800)	1,200
Additional contribution (1,200 * 4,000)	4,800,000
Net negative impact on current profit	**(2,880,000)**

Option (b)

Current contribution per water pump	2,000
Increase production of impellers by 2,000 units using overtime	
Increase in variable cost per impeller	(300)
New contribution per unit of water pump	1,700
Additional contribution from 2,000 units	3,400,000
Incremental fixed overheads	(2,000,000)
Increase in profit	1,400,000
Purchase balance 2,000 externally	
Current contribution per water pump	2,000
Decrease in contribution if purchased externally (2,000 – 800)	1,200
Incremental contribution (2,000 * 1,200)	2,400,000
Positive impact on current profit	**3,800,000**

Option (c)

	Rs.
Contribution if purchased externally	1,200
Quantity to be purchased externally	4,000
Additional contribution	**4,800,000**

Therefore it is recommended to purchase the additional requirement of impellers from the external market**.**

(Total: 10 marks)

Alternative Answer 1 (based on the incremental cost approach)

Option (a)

	Rs.
*Purchase cost from external market (16,000 * 1,600)*	*(25,600,000)*
*Saving in variable cost (12,000 * 800)*	*9,600,000*
*Fixed cost savings (200 * 12,000 * 80%)*	*1,920,000*
Total incremental cost over present situation	*(14,080,000)*

Option (b)

	Rs.
No incremental cost up to first 12,000 units	
For additional 2,000 units → (800 + 300) = 1,100	
*Rs. 1,100 * 2,000 (additional labour cost)*	*(2,200,000)*
Incremental fixed overheads	*(2,000,000)*
	(4,200,000)
For balance 2,000 units	
2,000 units from external market at Rs. 1,600	*(3,200,000)*
Total incremental cost over present situation	*(7,400,000)*

Option (c)

No incremental cost for first 12,000 units	
4,000 units from external market at Rs. 1,600	*(6,400,000)*
Total incremental cost over present situation	*(6,400,000*

Lowest incremental cost from Option (c). Therefore Option (c) would be the best option to maximise the profits of WPL.

(Total: 10 marks)

Alternative Answer 2 (based on the total cost approach)

Option (a)

Units to be purchased	16,000
At Rs. 1,600	Rs. 25,600,000

Since fixed costs are also incremental/avoidable (like other direct costs), they cannot be a saving.

Option (b)

		Rs.
Variable cost 12,000 units * 800		(9,600,000)
Fixed cost (200 * 12,000 * 80%)		(1,920,000)
For 2,000 → increase production		
2,000 * Rs. 1,100	2,200,000	
Incremental fixed overheads	2,000,000	
Production cost of additional 2,000 in-house		(4,200,000)
2,000 units from external market at Rs. 1,600		(3,200,000)
Total cost		(18,920,000)

Option (c)

	Rs.
Variable cost 12,000 units * 800	(9,600,000)
Fixed cost (200 * 12,000 * 80%)	(1,920,000)
4,000 units from external market at Rs. 1,600	(6,400,000)
Total cost	(17,920,000)

Lowest total cost reported in Option (c). Therefore Option (c) would be the best option to maximise the profits of WPL.

(Total: 10 marks)

Answer 04

Based on the price of Rs. 5,000 and the price structure of cost + 25%, we could ascertain that:

Mark-up   = 1,000 (5,000 * 25/125)
Total cost = 4,000 (5,000 – 1,000)

Based on the cost structure of variable 75%, fixed 25%
Variable cost = Rs. 3,000
Fixed cost   = Rs. 1,000

January

Since the entire production capacity can be sold in the external market, the transfer price should be marginal cost + opportunity cost.

Marginal cost = 3,000 – 500 (packaging cost) = 2,500
Opportunity cost is the loss of contribution = 5,000 – 3,000 = 2,000
Therefore transfer price = 2,500 + 2,000 = 4,500
This is equivalent to the market price rule:
$\rightarrow$ Transfer price = External market price – avoidable selling cost

Transfer price = 5,000 – 500 = 4,500

February

For the 3,000 units for which no external market is available, opportunity cost does not apply.

Therefore the first 3,000 units supplied to Star should be at the marginal cost of Rs. 2,500. The balance should be at Rs. 4,500 as explained above (January scenario).

March

For the 2,000 units (3,000 * $^2/_3$), where an alternative is available:

Loss of contribution is 2,000,000/2,000 = Rs. 1,000 per unit

Transfer price should be 2,500 + 1,000 = 3,500

Accordingly the first 1,000 units should be supplied at Rs. 2,500
The next 2,000 units should be supplied at Rs. 3,500

(Total: 10 marks)

Answer 05

(a)

		Rs. million		
	Present	**A**	**B**	**C**
Contribution	32.00	28.00	27.00	24.00
Fixed cost	10.00	10.00	10.00	10.00
Operating profit	22.00	18.00	17.00	14.00
Average receivables at cost	32.00	21.78	15.00	8.00
Cost of holding debtors	6.40	4.36	3.00	1.60
Net profit	15.60	13.64	14.00	12.40
Present policy should be continued with				

(b)

- **Credit standards**

  - By liberalising the credit policy, the volume of sales can be increased resulting in increased profits. The increased volume of sales is associated with certain risks too. It will result in enhanced costs and the risk of bad debts and delayed receipts.
  - The increase in number of customers will increase the clerical work of maintaining additional accounts and collecting information on the creditworthiness of customers.
  - There may be more bad debt losses due to the extension of credit to less worthy customers. These customers may also take more time than normally allowed in making the payments; resulting in the tying up of additional capital in receivables.
  - Extending credit to only creditworthy customers will save costs like bad debt losses, collection costs, investigation costs etc. However, the restriction of credit to such customers only will certainly reduce the sales volume, thus resulting in reduced profits.

- **Length of the credit period**

  - A company fixes its own terms of credit, depending on its customers and the volume of sales.
  - Competitive pressure from other firms should make them follow similar credit terms, otherwise customers may feel inclined to purchase from a firm that allows more days for paying for credit purchases.
  - Sometimes more credit time is allowed to increase sales to existing customers and also attract new customers.
  - The length of the credit period and the amount of discount allowed determine the magnitude of investment in receivables.

- **Cash discounts**

  ➢ A cash discount is given to expedite the collection of receivables. Customers paying well in time may also be allowed a certain cash discount.
  ➢ The company will be able to use the additional funds received from expedited collections due to the cash discount for other purposes of the business.
  ➢ Discounts involve a cost. Discounts should be allowed only if the cost is less than the earnings from additional funds.
  ➢ If the funds cannot be profitably employed then the discount should not be allowed.

Discount period

  ➢ The collection of receivables is influenced by the period allowed for the discount. Any additional period allowed for this facility may prompt some more customers to make use of the discount and make payments.
  ➢ This will mean additional funds released from receivables, which could be used for alternative purposes.
  ➢ However, extending the discount period could result in a late collection of funds because those who were getting a discount and making payments per the earlier schedule will also delay their payments.

(Total: 10 marks)

SECTION 2

Answer 06

(a)

Summary

	Original	**Revised**	**Actual**
Production (batches)	10,000		8,000
Labour time per batch (hours)	3.00	3.45	3.3
Labour rate (Rs.)	200.00	180.00	180.00

(i)

Labour rate planning variance = (Standard rate – revised rate) * actual hours
Labour rate planning variance = (200 – 180) * 26,400 = 528,000 → Favourable

(ii)

Labour rate operating variance = (Revised rate – actual rate) * actual hours
Labour rate operating variance = (180 – 180) * 26,400 = Nil

(iii)

Labour efficiency planning variance = (Standard hours for actual production – revised hours for actual production) * standard rate
Labour efficiency planning variance = (3 * 8,000 – 3.45 * 8,000) * 200= 720,000 → Adverse

(iv)

Labour efficiency operating variance = (Revised hours for actual production – actual hours) * standard rate
Labour efficiency operating variance = (3.45 * 8,000 – 26,400) * 200 = 240,000 → Favourable

(b)   In order to assess the production manager's performance fairly, only the operational variances should be taken into account. As planning variances are outside the control of the production manager, labour rate planning and labour efficiency planning variances are not responsibilities of the production manager.

The labour rate operating variance is zero, which means that the production manager has utilised labour at the same revised rate without paying overtime or any extra payment.

The labour efficiency operating variance has a favourable result. This means that the production manager has utilised less labour hours for the production of 8,000 batches compared to the revised labour hours.

These two operating variances show that the production manager has improved his performance.

(c)   Material mix variance = (Actual quantity in standard mix – actual quantity in actual mix) * standard price

	Standard mix	Actual quantity in standard mix	Actual quantity in actual mix	Variance quantity	Variance (Rs.)
Vegetable fat (Rs. 175 per kg)	9.0	72,900	71,500	1,400	245,000
Natural aromatic base (Rs. 4,000 per kg)	0.3	2,430	3,200	(770)	(3,080,000)
Chemical compound (Rs. 950 per kg)	0.7	5,670	6,300	(630)	(598,500)
	10.0	**81,000**	**81,000**	**-**	**(3,433,500)**

Yield variance = (Actual quantity in standard mix – standard quantity in standard mix)* standard price

	Standard mix	Standard quantity in standard mix	Actual quantity in standard mix	Variance quantity	Variance (Rs.)
Vegetable fat (Rs. 175 per kg)	9.0	72,000	72,900	(900)	157,500 Adverse
Natural aromatic base (Rs. 4,000 per kg)	0.3	2,400	2,430	(30)	120,000 Adverse
Chemical compound (Rs. 950 per kg)	0.7	5,600	5,670	(70)	66,500 Adverse
	10.0	**80,000**	**81,000**	**(1,000)**	**(344,000)**

The actual quantities used have not been mixed according to the standard recipe. This has resulted in over-usage of costly items (natural aromatic base and chemical compound). Although there is a saving in vegetable fat, its cost is much less compared to the other two materials. Accordingly, though the required aromatic level is achieved the production manager has not thought of the cost of production.

In order to get the 8,000 actual batches the production manager has used materials more than the standard quantity. This has resulted in a negative yield variance of Rs. 344,000. Vegetable fat, aromatic base and chemical compound have been used in excess resulting in a loss of materials in production.

Based on the above it is not evident that the production manager has done a good job. The management should look into this and take corrective action with respect to the production process.

(d)   Process benchmarking is the practice of comparing processes with a partner as part of an improvement process. For example, YPP can compare its production process, machinery used in the production arrangement of the factory line, work flow etc., use of labour etc., with those of peers in the same industry or even those of firms in different industries, and then apply/practice the best practices in YPP in order to achieve production efficiencies and improvements as done by the benchmarked companies.

Further, companies may analyse a competitor's supply chain function in the hope of identifying successful elements of the process, which it can use to its advantage.

(Total: 25 marks)

Answer 07

Relevant learning outcome/s: 3.7.2 and 3.7.3
3.7.2 Compute non-discounted cash flow methods (payback/accounting rate of return) and discounted cash flow methods (net present value/internal rate of return/profitability index/discounted payback) with: - Inflation   - Tax   - Uncertainty (use of probabilities and sensitivity analysis is expected)
3.7.3 Evaluate projects considering results derived from non-discounted cash flow and DCF valuation methods and other related factors.
Study text reference: Pages 467 – 469, 471– 485

(a) (i)

Parking charges at current prices

Expected value per car per week		
Charge (Rs.)	**Probability**	**(Rs.)**
3,000	40%	1,200
2,500	25%	625
3,500	35%	1,225
		3,050

Revenue per annum at current prices = 3,050 * 600 * 75% * 52 = Rs. 71,370,000
Revenue in Year 1 = 71,370,000 * 1.05 = Rs. 74,938,500
Contribution in Year 1 = 74,938,500 * 80% = Rs. 59,950,800

Cash flows

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Contribution	**59,950,800**	**62,948,340**	**66,095,757**	**69,400,545**	**72,870,572**	
Fixed costs:						
Hiring costs	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000	
Staff costs	18,200,000	18,928,000	19,685,120	20,472,525	21,291,426	
Security system	5,200,000	5,408,000	5,624,320	5,849,293	6,083,265	
Total cost	**25,900,000**	**26,836,000**	**27,809,440**	**28,821,818**	**29,874,690**	
Pre-tax net cash flow	**34,050,800**	**36,112,340**	**38,286,317**	**40,578,727**	**42,995,882**	
Less: Tax depreciation	25,000,000	25,000,000	25,000,000	25,000,000		
Taxable profit	**9,050,800**	**11,112,340**	**13,286,317**	**15,578,727**	**42,995,882**	
Tax liability at 28%	2,534,224	3,111,455	3,720,169	4,362,044	12,038,847	
Tax payment (same year)	1,267,112	1,555,728	1,860,084	2,181,022	6,019,423	
Tax payment (next year)		1,267,112	1,555,728	1,860,084	2,181,022	6,019,423
Total tax payment	**1,267,112**	**2,822,840**	**3,415,812**	**4,041,106**	**8,200,445**	**6,019,423**
Money cost of capital = 1.053 * 1.045 – 1 (Fisher formula) = 0.10 = 10%						

NPV and IRR calculation

	Year 0	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	
	Rs.	**Rs.**	**Rs.**	**Rs.**	**Rs.**	**Rs.**	
Land	(400,000,000)					500,000,000	
Pre-tax net cash flows		34,050,800	36,112,340	38,286,317	40,578,727	42,995,882	
Tax payment		(1,267,112)	(2,822,840)	(3,415,812)	(4,041,106)	(8,200,445)	(6,019,423)
Post-tax net cash flows	**(400,000,000)**	**32,783,688**	**33,289,500**	**34,870,505**	**36,537,621**	**534,795,437**	**(6,019,423)**
DF at 10%	1.0000	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645
Discounted cash flows	(400,000,000)	29,803,353	27,511,984	26,198,727	24,955,687	332,065,890	(3,397,808)
NPV	**37,137,832**						
DF at 15%	1.0000	0.8696	0.7561	0.6575	0.5718	0.4972	0.4323
Discounted cash flows	(400,000,000)	28,507,555	25,171,645	22,927,923	20,890,503	265,887,849	(2,602,363)
NPV	**(39,216,887)**						
IRR = 10% + $\dfrac{37,137,832}{76,354,720}$ * 5% = 12.43%							

(ii)

The project has a positive NPV and an IRR greater than the cost of capital. Therefore it should be accepted.

(b)

NPV is the net value addition to the firm by the end of the project duration, in present value terms, after allowing a return of 10% on the investment.

IRR is the annual average rate at which the project returns are generated. In other words if returns on investment are allowed to be withdrawn at 12.43% per annum, the value addition will be zero.

(c)

The time value of money relates to the return required by investors and has three main elements.

Delayed consumption
There is an opportunity cost involved with the investment of funds. Generally the value of Rs. 1 now is greater than the value of Rs. 1 in one year's time, since investors have to give up present consumption. An investor will give up present consumption for the potential of higher future consumption (i.e. they need to be rewarded for giving up certain current consumption for certain future consumption).

Inflation
If there is inflation then investors also need to be compensated for the loss in purchasing power as well as for time.

Risk
The promise of money in the future carries with it an element of risk. The payout may not take place or the amount may be less than expected. An investor therefore needs to be compensated for time, inflation and also risk.

The objective of investment within a company is to create value for its owners. Investors have alternative uses for their funds and therefore have an opportunity cost if money is invested in a corporate project. Investments therefore must generate enough cash for all investors to receive their required returns. The use of net present value in investment appraisal recognises the time value of money and discounts cash flows at the investors' required rate of return.

(Total: 25 marks)