MARKS

Question No. 2

(a) Break-even Sales Revenue:

Calculation of total contribution:

		Rupees	
Product 'RAX'	(552,000 x Rs.216)	119,232,000	0.5
Product 'MAX'	(1,200,000 x Rs.94)	112,800,000	0.5
Product 'ZAX'	(456,000 x Rs.168)	76,608,000	0.5
		308,640,000	0.5

Calculation of total sales revenue:

		Rupees	
Product 'RAX'	(552,000 x Rs.360)	198,720,000	0.5
Product 'MAX'	(1,200,000 x Rs.294)	352,800,000	0.5
Product 'ZAX'	(456,000 x Rs.480)	218,880,000	0.5
		770,400,000	0.5

Break-even revenue = Fixed costs ÷ *Contribution margin ratio

= 246,240,000 ÷ 0.4 = Rs.615,600,000 02

*Contribution margin ratio = 308,640,000 ÷ 770,400,000 = 40%

(b) Sales Promotion Plan for Product 'RAX' – At Selling Price of Rs. 330:

	Rupees	
Total contribution [708,000 x (330 – 144 = 186)]	131,688,000	0.5
Less: existing planned contribution	119,232,000	0.5
Extra contribution	12,456,000	0.5
Less: additional fixed costs	7,200,000	0.5
Additional contribution to generate fixed costs	5,256,000	0.5

Sales promotion plan for Product 'RAX' at selling price of Rs.306

	Rupees	
Total contribution [780,000 x (306 – 144 = 162)]	126,360,000	0.5
Less: existing planned contribution	119,232,000	0.5
Extra contribution	7,128,000	0.5
Less: additional fixed costs	7,200,000	0.5
Contribution to generate fixed costs	(72,000)	0.5

It is worthwhile to incur expenditure on advertising and sales promotion at a selling price of Rs.330 per unit. 01

(c) Required Sales Units – At a Price of Rs.306 per Unit:

Required contribution = [(Existing contribution + Additional fixed costs) ÷ Unit contribution]

= [(119,232,000 + 7,200,000) ÷ 162] = 780,444 units 02

MARKS

Question No. 3

(a) Net Advantage/ Disadvantage:

Rupees

	Per unit Differential Costs		Total Cost of 25,000 Units		
	Make	**Buy**	**Make**	**Buy**	
Cost of purchasing	–	7,330	–	183,250,000	01(0.5+0.5)
Cost of Making:					
Direct materials	1,840	–	46,000,000	–	01(0.5+0.5)
Direct labour	2,100	–	52,500,000	–	01(0.5+0.5)
Special testing cost	330	–	8,250,000	–	01(0.5+0.5)
Variable manufacturing overhead	960	–	24,000,000	–	01(0.5+0.5)
Fixed Manufacturing overhead	1,800	–	45,000,000	–	01(0.5+0.5)
Total cost	7,030	7,330	175,750,000	183,250,000	

Rs.9,150,000 rental value of the space being used to produce speedometers represents an opportunity cost of continuing to produce the product internally. Thus, the completed analysis would be:

Rupees

	Make	**Buy**	
Total cost, as above	175,750,000	183,250,000	01(0.5+0.5)
Rental value of the space (opportunity cost)	9,150,000	–	0.5
Total cost, including opportunity cost	184,900,000	183,250,000	01(0.5+0.5)

Net advantage in favour of buying is Rs.1650,000 per annum, therefore management of the company must go for local purchasing instead of in-house production. 0.5

(b) The most important factors to remember is that the decision should not be based solely on cost considerations. Management should weigh up the non-financial benefits of internal production against those of outsourcing. 05

The make option should give management more direct control over the work, but the buy option often has the benefit that the external organization has a specialist skill and expertise in the work. Other issues to consider are:

- How can spare capacity freed up by subcontracting be used most profitably?
- Could the decision to use an outside supplier cause an industrial dispute?
- Would the sub-contractor be reliable with delivery times and product quality?
- Does the company wish to be flexible and maintain better control over operations by making everything itself?

MARKS

Question No. 4

(a) Net present value (NPV) of the machine replacement investment.

					Rupees	
Years	**0**	**1**	**2**	**3**	**4**	
Operating cost savings	–	550,000	950,000	1,250,000	1,550,000	01(0.25each)
Depreciation on new machine	–	(420,000)	(357,000)	(303,450)	(257,933)	01(0.25each)
Taxable savings	–	130,000	593,000	946,550	1,292,068	01(0.25each)
Tax at 30%	–	(39,000)	(177,900)	(283,965)	(387,620)	01(0.25each)
New machine's profit after tax	–	91,000	415,100	662,585	904,447	01(0.25each)
Add back depreciation	–	420,000	357,000	303,450	257,933	01(0.25each)
Purchase of new machine	(2,800,000)	–	–	–	–	0.25
Sale of old machine	168,000	–	–	–	–	0.25
Tax on sale of old machine	(50,400)	–	–	–	–	0.25
Sale proceed from new machine	–	–	–	–	500,000	0.25
Tax saving on loss of new machine	–	–	–	–	288,485	0.25
Total after tax cash flows	(2,682,400)	511,000	772,100	966,035	1,950,865	1.25(0.25each)
Discount factor at 15%	1.000	0.870	0.756	0.658	0.572	
Present values	(2,682,400)	444,570	583,708	635,651	1,115,895	1.25(0.25each)
NPV	**97,423**	**–**	**–**	**–**	**–**	0.25

(b) IRR of replacement investment:

					Rupees	
Years	**0**	**1**	**2**	**3**	**4**	
Total after tax cash flows	(2,682,400)	511,000	772,100	966,035	1,950,865	
Discount factor at 17%	1.000	0.855	0.731	0.624	0.534	
Present values	(2,682,400)	436,905	564,405	602,806	1,041,762	2.5(0.5each)
NPV	**(36,522)**					0.5

Interpolate: IRR = $r_a + [NPV_a \div (NPV_a - NPV_b) \times (r_b - r_a)]$

= $15\% + [97,423 \div (97,423 + 36,522)] \times (17\% - 15\%)$ = 16.45% 01

Question No. 5

(a) Quantity Schedule:

	Units	
Beginning units in process (40% conversion)	60,000	0.25
Units started in process	240,000	0.25
Total units in process	300,000	0.25
Units transferred out	222,000	0.25
Units lost in the process: Normal	30,000	0.25
Abnormal	12,000	0.25
Units still in process (75% conversion)	36,000	0.25
	300,000	0.25

MARKS

Cost Charged to Department:

		Rupees	
Cost of beginning work-in-process (WIP)			
Material	600,000		0.25
Labour	720,000		0.25
Overheads	280,000	1,600,000	0.25
Cost added during the month (including re-work cost)			
Material	3,255,000		0.25
Labour	4,600,000		0.25
Overheads	2,100,000	9,955,000	0.25
Total cost to be accounted for		11,555,000	0.25

Cost Accounted for as follows:

		Rupees	
Transferred to next department:			
Opening WIP			
Cost brought forward	1,600,000		0.25
Cost added during the month (36,000 x 28.78) (W-1)	1,036,080	2,636,080	0.25+0.25
Units started and completed during the month (162,000 x 44.28)		7,173,360	0.25
		9,809,440	0.25
Cost of Abnormal spoilage:			
Material (12,000 x 15.5)	186,000		0.25
Conversion [(7,800 x 28.78) + (16 rounding error)]	224,500	410,500	0.25+0.25
Closing WIP:			
Material (36,000 x 15.5)	558,000		0.25
Conversion (27,000 x 28.78)	777,060	1,335,060	0.25+0.25
Total cost accounted for		11,555,000	0.25

W-1: Equivalent Production and Cost per Unit:

	Completed out of Opening WIP	Started and Completed	Abnormal Loss	Completed Closing WIP	Equivalent Units	Total Cost	Cost per Equivalent Unit	
Material	–	162,000	12,000	36,000	210,000	3,255,000	15.50	1.5
Conversion	36,000	162,000	7,800	27,000	232,800	6,700,000	28.78	1.5
							44.28	0.25

MARKS

Question No. 6

Cash Flow Forecast for Six Months ending February 28, 2018:

Rupees

	September	October	November	December	January	February	
Receipts:							
Cash sales (35%)	504,000	672,000	756,000	840,000	1,008,000	1,260,000	03(0.5each)
Cash received from debtor (W-1)	–	711,360	1135,680	1316,640	1466,400	1734,720	2.5(0.5each)
Total receipts (A)	504,000	1,383,360	1,891,680	2,156,640	2,474,400	2,994,720	
Payments:							
To creditors (W-2)	808,000	1,768,000	1,962,000	2,092,000	2,126,000	1,996,000	1.5(0.25each)
Trade license and other local taxes	–	–	–	–	–	115,200	0.25
Salaries and wages	36,000	36,000	36,000	36,000	36,000	36,000	0.25
Electricity	–	–	–	30,000	–	–	0.25
Printing, stat & postage	6,000	6,000	6,000	6,000	6,000	6,000	0.25
Purchase of van	–	–	–	288,000	–	–	0.25
Purchase of business	1,200,000	–	–	–	–	–	0.25
Lease premium and rental	540,000	–	–	–	–	–	0.25
Total payments (B)	2,590,000	1,810,000	2,004,000	2,452,000	2,168,000	2,153,200	1.5(0.25each)
Net cash flow (A-B)	(2,086,000)	(426,640)	(112,320)	(295,360)	306,400	841,520	
Opening cash balances (W-3)	***1,740,000**	(346,000)	(772,640)	(884,960)	(1,180,320)	(873,920)	0.25
Closing cash balances	(346,000)	(772,640)	(884,960)	(1,180,320)	(873,920)	(32,400)	1.5(0.25each)

Working:

W-1: Cash Received from Debtors:

Rupees

	Credit Sales	September	October	November	December	January	February
September	936,000	–	711,360	187,200	–	–	–
October	1,248,000	–	–	948,480	249,600	–	–
November	1,404,000	–	–	–	1,067,040	280,800	–
December	1,560,000	–	–	–	–	1,185,600	312,000
January	1,872,000	–	–	–	–	–	1,422,720
February	2,340,000	–	–	–	–	–	–
Total		–	711,360	1,135,680	1,316,640	1,466,400	1,734,720

MARKS

W-2: Cash Paid to Creditors:

Rupees

	Credit Purchase	September	October	November	December	January	February
September	1,616,000	808,000	808,000	–	–	–	–
October	1,920,000	–	960,000	960,000	–	–	–
November	2,004,000	–	–	1,002,000	1,002,000	–	–
December	2,180,000	–	–	–	1,090,000	1,090,000	–
January	2,072,000	–	–	–	–	1,036,000	1,036,000
February	1,920,000	–	–	–	–	–	960,000
Total		808,000	1,768,000	1,962,000	2,092,000	2,126,000	1,996,000

W-3: *Opening balance = Rs.1,200,000 + Rs.540,000 = Rs.17,40,000

Question No. 7

(a) Budgeted Profit Statement:

		Rupees	
Sales (20,000 x 1,680)		33,600,000	0.5
Material-X (20,000 x 6 x Rs.147.0)	17,640,000		0.5
Material-Y (20,000 x 3 x Rs.38.4)	2,304,000	19,944,000	0.5
Labour (20,000 x 4.5 x Rs.100.8)		9,072,000	0.5
Overheads		1,296,000	0.5
Profit		3,288,000	0.5

Actual Profit Statement:

		Rupees	
Sales (19,250 * 1,659)		31,935,750	0.5
Material-X	18,849,600		0.5
Material Y	1,994,685	20,844,285	0.5
Labour		9,191,490	0.5
Overheads		1,452,600	0.5
Profit		447,375	0.5

MARKS

(b) Variances:

Material price variance	=	(Actual quantity x Standard rate) – Actual cost			
Material-X	=	(123,200 kg x Rs. 147) – Rs. 18,849,600	=	Rs. 739,200 A	0.75
Material-Y	=	(52,938 kg x Rs. 38.40) – Rs. 1,994,685	=	Rs. 38,134 F	0.75
Material usage variance	=	(Standard quantity – Actual quantity) x Standard price			
Material-X	=	(115,500 – 123,200) x Rs. 147	=	Rs. 1,131,900 A	0.75
Material-Y	=	(57,750 – 529,368) x Rs. 38.40	=	Rs. 184,781 F	0.75
Wage rate variance	=	(Standard price – Actual price) x Actual hours			
	=	(100.8 – 103.8) x 88,550	=	Rs. 265,650 A	01
Labour efficiency variance	=	(Standard hours – Actual hours) x Standard price			
	=	(86,625 – 88,550) x Rs. 100.8	=	Rs. 194,040 A	01
Fixed overhead expenditure variance	=	Budgeted cost – Actual cost			
	=	(Rs. 1,296,000 – Rs. 1,452,600)	=	Rs. 156,600 A	0.5
Sales margin price variance	=	(Actual price – Budgeted price) x Actual volume			
	=	(Rs. 1,659 – Rs. 1,680) x 19,250	=	Rs. 404,250 A	0.5
Sales margin volume variance	=	(Actual sales volume – Budgeted sales volume) x Standard contribution margin			
	=	(19,250 – 20,000) x Rs. 229.2*	=	Rs. 171,900 A	01
*Standard contribution margin	=	Per unit sales price – Per unit variable cost			
	=	1,680 – [(147.0 x 6) + (38.4 x 3) + (100.8 x 4.5)]			
	=	1,680 – 1,450.8	=	229.2	

Profit Reconciliation:

	Rupees	
Budgeted profit	3,288,000	0.25
Add: Favourable variance (38,134+184,781)	222,915	0.5
	3,510,915	0.25
Less: Un-favourable variances (739,200 + 1,131,900 + 265,650 + 194,040 + 156,600 + 404,250 + 171,900)	3,063,540	0.5
Actual profit	447,375	0.5

(c) The purchase of cheap, poor quality materials below standard price will result in a favourable price variance but may be the cause of an adverse material usage and labour efficiency variance. Similarly, the use of unskilled instead of skilled labour will result in a favourable wage rate variance and may be the cause of an adverse material usage variance arising from spoil work and excessive usage of materials. The use of less skilled labour may also result in an adverse labour efficiency variance if the workers are not as efficient as skilled workers. 02

MARKS

Question No. 8

(a) Profit per day = Throughput contribution – Conversion cost

= [(Rs.6,200 x 12,891) + (Rs.6,200 x 9,720) + (Rs.13,500 x 2,592)] – Rs.125,600,000

= Rs. 49,580,200 02

(b) Efficiency of the Bottleneck Process:

Product	Minutes in Finishing Machine per Unit	Minutes in Finishing Machine per Day	
GH-I	(60 / 2,143) = 0.028	(12,891 x 0.028) = 361	01(0.5+0.5)
GH-II	(60 / 2,727) = 0.022	(9,720 x 0.022) = 214	01(0.5+0.5)
GH-V	(60 / 1,071) = 0.056	(2,592 x 0.056) = 145	01(0.5+0.5)
		= 720 minutes	

Total hours available 10, hours produced 12 (720 ÷ 60), thus efficiency is 120%. 01

(c) Throughput accounting (TA) ratio = Throughput contribution per factory hour ÷ Cost per factory hour

Conversion cost per factory hour = 125,600,000 ÷ 10 = Rs. 12,560,000 0.75

Product	Throughput Contribution per Factory Hour (Rupees)	Cost per Factory Hour (Rupees)	TA Ratio	
GH-I	6,200 x (60 ÷ 0.028 mins) = 13,286,600	12,560,000	1.06	0.75
GH-II	6,200 x (60 ÷ 0.022 mins) = 16,907,400	12,560,000	1.35	0.75
GH-V	13,500 x (60 ÷ 0.056 mins) = 14,458,500	12,560,000	1.15	0.75

THE END