SECTION A – 50 MARKS

Question One

(a)

(i) Calculate the total variable cost per unit. (2 marks)

(ii) Calculate the selling price of the product that will maximise the company's profits. (4 marks)

(i)

The direct material and labour costs are completely variable. This can be determined by dividing the combined costs of labour and material costs by the respective activity level in the forecast, which will result in the same cost per unit at all activity levels.

For example at activity level 100,000 units material and labour costs added together are $800,000, and therefore cost per unit = $8 per unit. This is the same rate at activity levels 160,000 and 200,000 units if you compare them with their respective combined material and labour costs.

Overhead costs however are not completely variable and must be analysed between fixed overheads and variable overheads.

We need to use the ñhigh-low methodò to find the variable overheads.

Units	Overhead cost ($)
200,000	1,460,000
100,000	800,000
100,000	580,000

$580,000 / 100,000 = $5.80.

Total variable cost per unit = $8 + $5.80 = $13.80.

(ii)

1. Determine the price function or demand function

The price or demand function formula is:

P = a - bx

P = Price
a = Price at which demand would be zero (i.e. the ñpò when x=0)
b = The gradient of the demand curve
x = Quantity sold at that price (P)

P = 25
b = 1 /25,000 = 0.00004
x = 150,000
a = ?

In order to determine the price function we need to first find the value of ñaò. Substitute all known values into the price function formula to determine ñaò.

25 = a ï 0.00004 (150,000)
25 = a ï 6
25 + 6 = a
31 = a

Now we can construct the price function:

P = 31 ï 0.00004x

2. Determine the marginal revenue function (MR)

The MR function is the price function itself, but it will have twice the value of whatever the ðbôvalue is, within the price function.

Therefore:

MR = 31 ï 2(0.00004)x
MR = 31 ï 0.00008x

3. Determine the marginal cost function (MC)

Marginal cost is given in the question as $13.80.

4. Equate MR = MC to obtain the units sold to maximise profits

MR = MC
31 ï 0.00008x =13.80
-0.00008x = 13.80 - 31
-0.00008x = -17.20
x = -17.20 / -0.00008
x = 215,000

Therefore we sell 215,000 units when we maximise our profits.

5. Use the price function to determine the selling price that would maximise profits

We can substitute in 215,000 units into the price function we created before to determine the selling price that will maximise profits.

P = 31 ï 0.00004x
P = 31 ï 0.00004 (215,000)
P = 31 ï 8.6
P = 22.4

The selling price that will maximise profits is $22.40.

(b) Explain TWO reasons why the company might decide NOT to use this optimum selling price. (4 marks)

Exam tip: Please note that the question only asks for two reasons however we have provided a selection of possible reasons. Any two would suffice.

The optimum selling process is derived from the price function or demand function.

The main problem with using the price function is that the quality of the market research to determine the demand function has to be very good, for it to have any real value; otherwise it may give unrealistic predictions.

It also assumes that price and quantity are the only factors in determining demand, but we must be mindful of other factors which are just as important such as quality, advertising, the availability of substitutes, brand loyalty, fashion, and the cost of complimentary products. It is difficult to estimate the demand curve.

The price function assumes that there is a linear or straight line relationship between price and demand in reality this may not be true.

It is difficult to determine the price at which demand would be zero in other words the maximum price that can be charged.

It is difficult to ascertain the variable costs accurately without detailed knowledge of cost curves this may not be available.

Question Two

For each of the

(i) Growth; and
(ii) Maturity stages of the new product's life cycle

explain the likely changes that will occur in the unit selling prices AND in the unit production costs, compared to the preceding stage. (10 marks)

(i) Growth stage

Unit selling prices

Due to the very short expected life cycle, during the growth stage as competition begins to enter the market, PT will have to reduce its selling price; in order to stay competitive as substitutes will be being produced by competitors. These substitutes would have been created by manufacturers purchasing PTôs product and reverse engineering the product.

This approach will aim to sustain demand and contribution from PQôs product as long the selling price is greater than the marginal cost of manufacturing the product. The cash flow will be used to develop other products in development.

Unit production costs

There will be a continued reduction in unit production costs of this product during its growth stage but unlikely to see any further reductions beyond this stage. This will be attributable to economies of scale being enjoyed by the company through mass production techniques, such as below:

- Learning curve effects enjoyed by the workforce because the production is labour intensive, repetitive and most of the staff is retained over the long term.

- Technical efficiencies learned by all departments in the manufacture of the product, especially the production department through improved understanding of how material and machines can be used more efficiently to maximise production.

- Stock control systems will be more efficient if the company employs a JIT approach to stock management. This will reduce stock holding costs to nil and material is only used or bought if there is a demand.

- Discounts will have been received as the company would buy more and more bigger batches of the raw material throughout the productôs life cycle.

- Total quality management techniques will be used which means that the product will be made to a very high standard reducing internal failure costs such as the inspection and scrap material and also reduction in external failure costs such as repairs and replacement.

(ii) Maturity stage

Unit selling price

The selling price would be unlikely to be reducing any further because the product would have now established itself in the market and reached a price that could be maintained until the end of the life of the product.

Unit production costs

During the maturity phase there is unlikely to be any further significant cuts in unit variable costs, and costs may begin to increase. This is expected as the demand for this product will be reduced significantly as it will have fallen out of favour with customers, and therefore less is being made and as a result fewer materials needed. The lower prices on raw materials cannot be enjoyed because of the reduced quantities bought by the company and hence the increase in unit production costs. In addition production costs will increase due to machine breakdowns and inefficiencies.

Question Three

Explain how JYT could use Target Costing AND Kaizen Costing to improve its future performance.

Your answer should include an explanation of the differences between Target Costing and Kaizen Costing. (10 marks)

Target costing is a strategy which seeks the selling price of a product which consumers are willing to pay, being the price that the product should be sold for in given market forces. Then deducting a desired level of benefit or profit for the organisation in order for the manufacture to be commercially viable, and then the product be manufactured within the value left over thereby becoming the budgeted costs or target costs.

Market price to achieve desired market share	XX
TARGET COST (balancing figure)	(XX)
Desired profit	XX

The target cost is normally achieved over the long term using learning and experience curve efficiencies and may take several years and so in the meantime the desired profit is squeezed to compensate.

Target costing is not simply a cost reduction exercise but a quality improvement strategy over the long term. It sacrifices short term profitability for long term profitability and combines the use of JIT, TQM, cost reduction, value analysis and benchmarking to achieve the target cost.

Kaizen costing is the process of continuous improvement through small incremental steps rather than transformational changes. It also believes strongly in empowerment of employees to enable them to improve operations. Kaizen costing focuses on reducing variable costs of future periods below that of prior periods.

- Human resources are your most valued asset and they should be involved in the search for perfection. They have superior knowledge as they are in the operation. This is the opposite of traditional systems where the managers develop standards.
- Incremental or gradual improvement.
- Perfection should be sought all the time and so there is always room for improvement.
- Cost reduction targets more frequent rather than traditional annual standard costs.
- Variance analysis used to help with kaizen costing.
- Investigations carried out if targets not met even if improvements have been made.

Unlike kaizen costing, target costing doesnôt focus on gradual cost reduction but starting from scratch and re-designing methods and processes to achieve large changes. Kaizen costing relies on all employees taking part in the process because it focuses on making small improvements by everyone.

Target costing is a strategy implemented before the launch or production of a product unlike kaizen costing which is employed when production has commenced.

Question Four

(a) Calculate the following operational variances based on the revised market details:

(i) The total sales mix profit variance (2 marks)

(ii) The total sales volume variance (2 marks)

(a) (i)

The **sales mix variance** shows the change in the **different product lines being sold** and the impact it has on profit or contribution.

	Actual sales quantity	Actual sales at budget mix (W1)	Difference	Profit	Variance
DVD	3,000	2,800	200 (F)	$25	$5,000 (F)
Blu-ray	1,200	1,400	200 (A)	$95	$19,000 (A)
	4,200	4,200			$14,000 (A)

Total sales mix profit variance = $14,000 (A)

Workings

W1 – Actual sales at budget mix

Revised demand for Blu-ray players of 1,500 units should be used in the budget instead of 1,000 units this is because of an unexpected growth in the total market for Blu-ray players.

DVD = 3,000 / 4,500 x 4,200 = 2,800
Blu-ray = 1,500 / 4,500 x 4,200 = 1,400

(a) (ii)

	Units
Did sell (actual quantity sold)	X
Should sell (original budget quantity sold)	(X)
	X
x Standard Profit per unit	
Sales volume (profit) variance	X

The sales volume (profit) variance measures the difference between the original and flexed budgeted profit. It measures the impact on profit, when actual sale of units is more or less than the original budgeted sale of units. This method of calculation would be applied when absorption costing is used by the organisation.

DVD sales volume variance = (3,000 ï 3,000) x $25 = $0
Blu-ray sales volume variance = (1,200 ï 1,500) x $95 = $28,500 (A)
Total sales volume variance = $28,500 (A)

(b) Explain, using the above scenario, the importance of calculating planning and operational variances for responsibility centres. (6 marks)

The planning variance is beyond the operational control of management and staff for example market size growth of Blu-ray player.

The operational variance is normally within the control of management and now more realistic as a yardstick because calculations would include any revisions to standard, in the case of the Blu-ray players, the revised budgeted demand due to changes in the total market share.

An example of an operational variance is the changes in the selling prices for the DVD and Blu-ray players resulting in variances which are controllable by management.

Planning variances will help highlight variances between those which are controllable and those which are uncontrollable. For example the sales managerôs email boasts a favourable $19,000 variance however it is not strictly entirely caused by his influences of sales, some of it is due to the increase in total market share of Blu-ray players which is not in the control of the sales manager. The budget for Blu-ray players should have been 1,500 units and therefore resulting in an adverse variance.

Planning variances help motivate managers and staff, for example avoids staff being blamed for faulty planning and gives a fairer reflection of any operational variances calculated when assessing any operational efficiencies or inefficiencies. Management and staff would be appraised more fairly for any favourable or adverse deviations that are within their control.

Planning variances make use of realistic standards in order to measure performance gives better management information for control purposes.

Question Five

(a) Explain why non-financial performance measures are important in the service sector. (2 marks)

Non-financial performance measures recognise that the constant drive to increase profitability can ultimately be self-defeating and that it is imperative that organisations do not put the needs of shareholders above all else. The primary goal of most profit seeking enterprises is to increase shareholder value through increasing profit; however non-financial performance measures are equally as important as they ultimately drive profitability and therefore shareholder value. For example level of customer satisfaction, innovation, quality and morale of the work force, all indicate how well the company is doing things that can lead to future profits.

Long-term benefits of using non-financial performance measures will be improved profitability when these performance measures are combined with financial performance measures and are monitored and used for control purposes.

(b) Recommend, with reasons, TWO non-financial performance measures that SFG could use to evaluate the performance of the hotel managers. (4 marks)

Exam tip: Please note that the question only asks for two reasons however we have provided a selection of possible reasons. Any two would suffice.

- **Customer satisfaction surveys** ï measures the number of complaints or recommendations at the hotel, also giving a rating for service received from the hotel staff and mangers. Cutting back on customer service costs may save money in the short term but will impact the long-term reputation of the hotel and reduced repeat business.
- **Training days per staff** ï measures the level of investment that the hotel has committed to improving staff technical and interpersonal skills.
- **Staff turnover** ï measures the number of staff leaving the hotel indicating that staff are perhaps dissatisfied with the hotel mangers approach to supporting the needs of staff.
- **The number of new hotel deals for accommodation and events** ï The more of these options are available created my by the managers the greater chance of increasing sales and repeat business. It may cost money to set up these deals and some money and in giving discounts or free ñtasterò days but in the long-term it would increase sales.

(c) Explain why, and how, non-controllable costs should be shown on the profit reports. (4 marks)

An uncontrollable cost does not mean a manager being assessed should ignore it altogether. As an example if managers recognise there is an interest charged by head office based upon the capital employed used within a division, then to hold them more accountable could help improve efficiency by the minimisation of capital employed. In the case of head office charges, lack of accountability could encourage over consumption of these resources provided centrally. However it would be considered fairer if a manager were not assessed on costs which are not within their own control. This is likely to improve motivation and morale.

The way to include non-controllable costs when assessing the performance of the manger on a fair basis is to put them into a separate section with in the report; however it is not always clear when determining controllable and non-controllable costs. Political arguments may ensue which are more subjective than objective when determining controllability.

SECTION B – 50 MARKS

Question Six

(a) Prepare, in an appropriate format, a columnar statement that will help the managers of the hotel to plan for next year. Your statement should show the hotel's activities by season and in total. (6 marks)

	$	Peak $	$	Mid $	$	Low $	$	Total $
Room revenue		855,000		720,000		412,500		1,987,500
Guest related costs (W1)		(184,680)		(162,000)		(108,000)		(454,680)
Room costs (W2)		(68,400)		(81,000)		(82,500)		(231,900)
Avoidable general costs (W3)		(225,000)		(300,000)		(375,000)		(900,000)
Room / Guest contribution		376,920		177,000		(153,000)		400,920
Snacks								
Gross contribution (W4)	4,617		12,150		8,150		24,867	
Cook costs	(5,000)		(6,667)		(8,133)		(20,000)	
		(383)		5,483		(233)		4,867
Restaurant								
Gross contribution (W5)	17,313.75		33,750		47,250		98,313.75	
Staff costs	(13,500)		(18,000)		(22,500)		(54,000)	
		3,813.75		15,750		24,750		44,313.75
Total contribution		380,350.75		198,233		(128,483)		450,100.75
Non-avoidable general costs		(75,000)		(100,000)		(125,000)		(300,000)
Net contribution		305,350.75		98,233		(253,483)		150,100.75
Hotel annual fixed costs								(200,000)
Hotel annual profit								(49,899,25)

Workings

W1 – Guest related costs

Season	Days (D)	Rooms (R)	Occupants (O)	Guests (D x R x O)	Guest related costs ($12 per guest per night)
Peak	90	95	1.8	15,390	184,680
Mid	120	75	1.5	13,500	162,000
Low	150	50	1.2	9,000	108,000

W2 – Room costs

Peak = ($5 + $3) x 90 days x 95 rooms = $68,400
Mid = ($5 + $4) x 120 days x 75 rooms = $81,000
Low = ($5 + $6) x 150 days x 50 rooms = $82,500

W3 – Avoidable general costs

Peak = $300,000 x 75% = $225,000
Mid = $400,000 x 75% = $300,000
Low = $500,000 x 75% = $375,000

W4 – Snacks gross contribution

Peak = 15,390 guests x 10% x $10 x 30% = $4,617
Mid = 13,500 guests x 30% x $10 x 30% = $12,150
Low = 9,000 guests x 30% x $10 x 30% = $8,100

W5 – Restaurant gross contribution

Peak = 15,390 guests x 30% x $15 x 25% = $17,313.75
Mid = 13,500 guests x 50% x $20 x 25% = $33,750
Low = 9,000 guests x 70% x $30 x 25% = $47,250

(b)

(i) Identify, based on your statement, the actions that the managers could take to maximise the profit of the hotel for next year. (3 marks)

(ii) Explain TWO factors that the mangers should consider before implementing the actions you identified in (b) (i). (4 marks)

(i)
Overall from our statement it is obvious that the hotel is making losses of nearly $50,000. Actions management could take to maximise profits:

- During the low season they could shut down the hotel as it is making the main losses in this part of the year.

- Close down the snack service during the peak and the low season as it makes losses in these seasons but makes profits during the mid season when it should remain open.

(ii)
Other factors that the managers should consider:

It should be investigated as to how easily the snack service can be shut down and re-opened only for the mid season.

If the snack service was closed entirely whether or not this would encourage guests to use the restaurant.

If the hotel was closed during the low season whether or not this would still retain the regular guests to come in the peak and mid season or whether guests will view this as being an obvious move to focus on profits rather than customer service.

Question Seven

(a) Prepare an analysis of the sales made by Division E that shows clearly, in units and in $, the internal and external sales made during the year. (3 marks)

Division E could have sold a further 42,000 components but was constrained by capacity and had to transfer 70,000 components internally to division D. Division E therefore lost out on achieving the market price for 42,000 components, and therefore the transfer price on these to division D should be market price. The rest of the components should be at variable cost.

Analysis

	Internal at variable cost	Internal at market price	External	Total
Number of components	28,000	42,000	70,000	140,000
	$000	$000	$000	$000
Variable cost	28,000	42,000	70,000	140,000
Sales value	28,000	65,100	108,500	201,600

(b) Discuss the effect of possible changes in external demand on the profits of Division E, assuming the current transfer pricing policy continues. (6 marks)

External demand is very important as it determines what profits are accrued to divisions D and E internally. Division E has sold 28,000 components at variable cost to division D. It could have sold them externally at $1550 and could have made a profit instead of making no profits through the internal transfer. If division D had bought externally rather than internally then it would have had to spend $43.4m to obtain the 28,000 components transferred to them at variable costs. This is an extra $15.4m.

Division D appears to enjoy higher profits because of the items transferred at variable cost, which may not be fair as division E is receiving no recognition for the manufacture of these items. There should be some benefit accrued to division E and maybe not full market price as it cannot sell these components externally. For example if the profits were shared equally between the divisions each division would have a profit of $7.7m.

If the market demand increased for components then the transfer price charged to division D would increase and thereby shifting more of the profits to division E. If market demand fell for the components then the transfer priced charged to division D would fall and thereby shifting more of the profits to division D.

(c) Assuming that the current transfer pricing policy continues:

(i) Evaluate the investment from the perspective of the manager of Division E. (6 marks)

(ii) Evaluate the investment from the perspective of the DE Company. (4 marks)

Note: Ignore inflation and taxation.

(i)
Eôs capacity will increase by 10% and variable costs will fall by 20% if the new investment is undertaken, however this benefit is reduced because of the internal transfer policy.

Any increase in capacity for division E will have the effect of increasing external sales but at the same time reducing the volume of forgone external sales when transferring components to division D. Therefore there is no additional financial benefit for division E.

Half of Eôs components are sold to D and 28,000 of these are transferred at variable costs. Cost savings are therefore transferred to D because of the transfer pricing policy. E will only enjoy cost savings on those items which are sold at market value.

Division E benefits:

VC of items sold at market value = $140m x 80% = $112m per annum

20% cost savings every year = $112m x 20% = $22.4m

PV of cost savings over 5 years at 8% cost of capital = $22.4m x 3.993 = $89.4m

The cost of the investment is $120m with no residual value and the cost saving from investment is going to only be $89.4m, therefore it is not financially viable from division Eôs perspective.

(ii)
We need to compare the original situation to the revised situation from a group perspective. We already know the benefits that would accrue to division E if the investment was undertaken (see part (i) above) and therefore we now need to do the same for division D.

Revised transfer value for division D:

42,000 components original cost of $42m x 80%	=	$33.6m
28,000 components market value of $1,550 per unit	=	$43.4m
Total		$77.0m

Original transfer value for division D = $28m + $65.1m = $93.1m

Saving = $93.1 - $77.0m = $16.1m

Total saving = $22.4m + $16.1m = $38.5m

PV = $38.5 x 3.993 = $153.73m

From a group perspective the investment of $120m is beneficial because the PV of $153.73m is greater than this cost.

(d) Explain TWO factors that should be considered when designing divisional performance measures. (6 marks)

It should be fair and consider those items that can be controlled by the manager.

It should simple to understand and easy to calculate so the impact of decisions taken by managers can be seen and measured.