Answer to 1(a)

Changes to product design to improve sales include:

- Limit MVA to excess interest; all credited interest; interest rate changes in excess of 25 basis points.
  - helps sales if limited
  - under current design has to be registered due to potential loss of principal. Primary distribution is agency.
- Add a 3-year guarantee product without MVA to expand options for customers who need liquidity.
- Offer a longer-term guarantee product such as 5, 7, or 10 years. Offering two guarantees is too limited.
- Consider reducing the surrender charge percentage to correspond to end of guarantee period.
- Remove MVA on death and annuitization
  - not a common feature – probably a competitive disadvantage
- May want to try a more level commission, although distribution usually prefers up-front commission.
  - pay commissions based on total account value.
- Reduced 1st year commission when account rolls over.
- Add a 30-day window for a penalty fee surrender

Additional features to add to product:

- A bailout provision
- A medical bailout provision
- Return of premium
- Guaranteed settlement rates on annuitization
- Penalty free partial withdrawal – allow the 10% to carry over to the next year if unused
- Provide a persistency bonus

1(b)

- Conduct a survey of existing contract holders
- Survey of field for what they believe consumers want
- Allow consumers to rank their product vs. other companies
- Allow consumers to rank their provisions vs. other companies
- Allow consumers to rank their provisions vs. each other
- Paired comparisons of this company vs. that; this product vs. that; this provision vs. that
- Monadic rating will indicate intensity of feeling and intent to buy – rank provisions, products, companies on a scale (0-10)

- Simulated test market – show consumers options and use what they buy – other test market strategies are too expensive
- Use conjoint analysis
- Use product and brand position maps

Answer to 2(a)

(i) Non level pattern of ROE may be due to:

- DAC amortization rate may be different from pricing ROI
- Required surplus investment rates may be different from pricing ROI (note that distributable earnings are not retained)
- Release of PADs in GAAP reserves
- Mixing of older and newer business
- Actual experience may fluctuate

(ii) ROE > Pricing ROE due to:

- The ROI is based on solvency reserves which are more conservative
- Solvency reserves also do not include DAC
- Actual experience may differ from pricing assumptions
- Taxes and tax deferrals may have an impact

2(b)

premium	$	11,000,582
expense allowance		37,690,109
death benefits		<2,870,212>
operating expenses		<42,901,380>
from product		2,919,099
investment income		591,092
investment income on required capital		786,589
taxes		<813,632>
cash flow		3,483,048

Distributable earnings are $4,743,991 and are greater than cash flow due to the inclusion of the changes in DAC, policy reserves and required surplus.

If the ROE is greater than Saturn's cost of capital, then the product is adding economic value
ROE 2000 = 10.8% < cost of capital = 13%, ∴ not creating economic value

The product is also not meeting the 15% profit target over years 1995 through 2002, possibly indicating the need for corrective action.

2(c) Reinsurance can impact ROE by:

- leveraging ROE (to extent reinsurers have lower ROE targets)
- tax planning
- if slope of reinsurance costs do not slope directly with mortality, the timing of earnings can be affected

- reducing the reserves through the reserve credit, but impact depends on how credit is calculated (e.g., GAAP usually "stand alone")
- transfer of risk may reduce required surplus levels
- expense allowances offset acquisition and maintenance expenses (can be negotiated with reinsurer)
- less variability in death benefits, therefore ROE more stable

2(d)

- Reserve method and assumptions will affect timing of profit recognition (which impacts ROI), but not total profit
- Product falls under FAS60, and profits should emerge as constant percent of gross premium, release of PADs, difference in expected to actual, investment income on required surplus, less non-deferable expenses
- Assumptions are locked in until a loss recognition event occurs
- Assumptions require reasonable/realistic PADs for mortality, interest and lapses – delays profit recognition

Answer to 3(a)

(i) Alternative 1) – if there's still 35% replacement sales: then the effective commission rate is: $4\% * (1-35\%) + 1\% \times (35\%) = 2.95\%$ less than the original 3% commission rate. But since the internal replacement will be discouraged by such commission structure, the replacement sales will decrease, so the 35% portion will be dropped to a very low figure. The resulting effective commission rate will exceed 3%. As the total volume of new business will drop, but only a little. The PV (total commission) will increase.

Alternative 2) – the PV (commission) will increase, since the PV of the annual trailing commission would exceed 1%, as long as the contract will be held for an average of 4 years (¼ x 0.25% = 1% assuming that the discount rate and the credit rate offset each other).

Alternative 3) – the PV (commission) will increase. Since if the replacement is an "old-age" policy, the commission rate will exceed 2%, which is more than the method 1, so the PV (commission) will also increase.

(ii) Alternative 1) – the agent financing cost will most likely decrease as mix of business shifts toward entirely new sales with higher commissions.

Alternative 2) – the agent financing cost will increase. Since the first year cost is decreased due to only 8%, that means the financial cost will increase.

Alternative 3) – the agent financing cost will decrease. Since the first year cost for new sales is 4%, more than the initial 3%, and the first year cost for replacement sale is also high if replacement on old policy. So, net financing cost will drop.

3(b) Generally the agent financing cost will be lower than other companies:

- Since Mercury has very good agency force, the agent has good aptitude, because the method of agent recruiting must be strict resulting in higher productivity quickly. So lower financing needed.
- Mercury Life has good training program, so agent finance cost is lower.
- The company itself and the agency is quite big and the company has high rating, this will lower agent financing cost because it attracts better agents who build up to full commissions quickly.
- Mercury has a lower than average commission for industry which might result in higher than average financing costs, but heaped in first year which will tend to lower financing costs.
- Annualized premium will result in lower financing cost.
- Personal circumstances can effect financing cost.

Answer to 4

- What is the profit carrier used?
- What is the matching principle?
- Is a going concern basis used?
- Is there any reinsurance, and how is it reported?
- Is the investment income reported net of any debt held?
- Is investment income net of expenses?
- How are capital gains handled?
- Does investment income include income on surplus?
- Is the reserve method specified by external authority?
- Are assumptions Best Estimate or are PADs used?
- Are PADs set by regulation or judgement?
- Are assumptions revised or locked in?
- If assumptions are changed, does the effect get reported in current year earnings, or amortized?
- Are reserves for benefits only, or do they include expenses or taxes?
- What are assumptions used in setting reserves?
  - mortality?
  - morbidity?
  - persistency?
  - interest?
  - inflation?
- Can acquisition expenses be deferred? If so, how are they amortized? Are there recoverability tests?
- Is there a liability for future dividends?
- Are there premium deficiency reserves?

Answer to 5

(a) Conjoint Analysis

- A tool that can be used to assess the utility value of a particular product feature
- The consumer is given a selection of product features and is asked to rank each one in terms of value to them
- For example:
  - 6 classes / extended convertibility / modified re-entry
  - 3 classes / conversion bonus / sell direct only
- Use statistical program to derive utility values
- It can tell the company which features are important to the consumer and which aren't by looking at difference between high and low utility value
- Can estimate achievable market share with large enough consumer sample
  Company can then weigh the cost of the feature against utility value to determine whether or not it should be offered
- Or can compare combinations of features two at a time and have consumers rank ("tradeoff analysis")
- Easier to perform than conjoint analysis, particularly when there are a lot of variables

(b) Additional Underwriting Classes

- Will increase first year underwriting expenses due to additional requirements (medical tests, etc.) and classes
- Will reduce mortality for better classes and increase mortality for worse classes; need to ensure data credible
- Increased requirements for all classes should improve mortality in aggregate

Convertibility Feature on ART & 3YRT

- People that convert normally in worse health $\Rightarrow$ consider impact on mortality of offering convertibility feature
- Can include an explicit conversion cost in pricing of term or spread extra mortality over all VUL policyholders
- Additional administration expense to process conversion

Conversion Bonus Payable to VUL

- May reduce anti-selection as more people convert to take advantage of bonus rather than due to poor health

Modified Re-entry Provision

- Underwriting expenses will increase due to re-underwriting
- Administration expense may increase to process re-entries
- Re-entry at any time promotes mortality anti-selection
- Penalty for failing to re-enter (ART reversion) means only the healthy will attempt to re-underwrite
- Deterioration spread over life of product rather than concentrated at renewal points

Sell Term Through Direct Channel

- Will eliminate commission costs
- Will increase number of cases handled by telephone U/W unit $\Rightarrow$ increase in U/W staffing costs
- May be offset by expense savings in other areas (new business, remuneration)
- Direct sales may reduce average policy size $\Rightarrow$ lower underwriting expense
- Also, lower average policy size will increase expected mortality
- May be appropriate to reflect expected growth in sales in setting unit expenses

(c) Mortality & Expense PAD (CIA)

Mortality Margin

- Canadian mortality margin to be added to expected assumption
  High = $15 / e_x$
  Low = $3.75 / e_x$
- High margin significant considerations – must use at least average of low and high margins if 1 out of 3 is present
  - Weak underwriting criteria $\Rightarrow$ not applicable as underwriting criteria has been strengthened
  - Poor persistency $\Rightarrow$ Saturn's persistency has been poor lately (A/E = 112%); re-entry feature will worsen this
  - New product with little experience or company mortality data not credible/relevant $\Rightarrow$ company has no credible experience to support expansion to 6 classes
- Other high margin condition: impact of convertibility features on term mortality uncertain
- Recommend near maximum margin of $15 / e_x$ because:
- 2 out of 3 significant considerations (high margin conditions) present

Expense Margin

- Expense margin to be added to expected assumption
  High = 10%
  Low = 2.5%

- High margin significant considerations – must use at least average of low and high margins if 1 out of 3 is present
  - Obsolete expense study ⇒ not applicable, company conducts annual expense study
  - Commissions vary by distribution channel and mix of sales dissimilar ⇒ Growth of direct channel has been affecting mix of inforce; ultimate impact unknown
- Low margin condition ⇒ cost control measures seem well established
- Recommend average (6.25%) of high/low
- Due to equal weight of high and low margin conditions

(d) Cost of Additional Mortality

- Cost of additional mortality is $\left(q^{IRM}_{[35]+5} - q^{VUL}_{[40]}\right) * NAR_1$
- Where $q^{IRM}_{[35]+5}$ is the term mortality rate assuming policy converted after 5 years
- $q^{VUL}_{[40]}$ is the newly underwritten mortality of the VUL product
- NAR_1 is the net amount at risk at the time of conversion
- $q^{IRM}_{[35]+5} = (6/15)*102\%*156 = .6365; \left(q^{soa7580}_{40} = 1.56 \text{from case study}\right)$
- $q^{VUL}_{[40]} = (1/15)*98\%*1.56 = .1019$
- So cost is .6365 - .1019 = .5346 per 1000 net amount at risk converted

Answer to 6(a)

(i) **Steps in the product development process**

- Idea generation – someone in organization has a new product idea
- Idea screening – preliminary review for corporate fit
- Concept development and testing – product idea refined, thinking about customers values
- Marketing Strategy Development – define target market and initial estimates of market share and total sales
- Business Analysis – refine sales estimates and profit projections
- Product Development – arrive at prototype product
- Market testing – sell prototype in a test market and evaluate consumer reaction
- Commercialization – roll out product to entire marketplace

(ii) Currently at the concept development and testing phase since there are still unresolved product features

6 (b)

(i) **Different methods of direct marketing include:**

- Direct mail – send out brochures; target by zip code etc.
- Print media – focus on magazines, newspapers etc. that cater to target demographics
- Radio & T.V. – advertise on programs that cater to target demographics
- Telemarketing – telemarketers calling people and/or providing 1-800 numbers
- Fax marketing
- Retail centers
- Kiosks – at grocery stores, malls, etc. with phone line back to head office
- Internet – online quote generation

(ii) **Potential fit for this product with type of individual normally served by direct marketing**

- Middle to lower income – product is a poor fit
- Senior citizens – product is a good fit
- Geographically remote – product could be a good or bad fit
- Credit card holders – product could be a good or bad fit
- Current Saturn Life customers - product could be a good or bad fit
- Respondents to direct marketing from other organizations - product could be a good or bad fit

(iii) **Overall sales potential for this product is poor because**

- the product is too complex to be sold via direct marketing

- the product is a poor fit with low and middle income individuals who are more readily reached via direct marketing
- is some potential to sell to the pre-retiree market via associations

(iv) These issues should be finalized in the marketing-strategy development stage of the product development process when the target market's size and behavior is assessed, along with the expected sales

6 (c)

(i) **Non-forfeiture principles apply to this product in the following manner**

- retrospective approach applies during the withdrawal period since the product has an account value
- account value is the single premium plus equity performance less company charges and annuity payments
- surrender value equals account value less surrender charges

(ii) Traditional immediate annuity doesn't have non-forfeiture benefits

(iii) Non-forfeiture issues should be completed during the product development portion because a product can't be sold until regulatory issues (such as non-forfeiture compliance) are resolved

6 (d)

(i) **This product's risks include:**

- Mortality (Longevity): Saturn Life has no previous experience with immediate annuity mortality
- Large policies at older ages could lead to earnings fluctuations
- Investment: earnings fluctuations arise because Saturn Life can't perfectly hedge each investment option and has exposure to the minimum performance guarantees
- Mortality anti-selection caused by unhealthy lives withdrawing

(ii) **Reinsurers can assist in mitigating these risks by:**

- Offering advice on product design and assumptions
- By smoothing earnings fluctuations caused by mortality, investment performance or surplus strain

(iii) The estimate of reinsurance cost should be available in the business analysis phase, as this estimate is necessary to project profitability. The actual reinsurance treaty can be finalized later on

Answer to 7

a. It is generally appropriate to reflect policy loans in the investment income factor. Policy loans depend on
- policy loan rate
- policy loan expense and
- whether loan interest is aggregated or passed through to individual policyholders

b. 8.75% should not be reflected in illustrations unless the earned rate without loans can be shown to equal or exceed 8.75%.

The illustrated scale must be the lesser of the currently payable scale or the disciplined current scale.

$$i^I = \beta\, i^L + (1-\beta) i^p$$

where i^I = portfolio rate

i^p = portfolio rate excluding policy loans

i^L = policy loan rate

β = policy loan utilization factor

$8\% = (20\%)(6\%) + (80\%)\, x$
$x = 8.50\% = i^p$

The currently payable scale without policy loans is 8.50%.

∴ 8.75% should not be illustrated

c. Credit interest based on Investment Generation Method as opposed to Portfolio Average Method.
During high interest rate environment, illustrated dividends will be more attractive than based on portfolio average approach.

Move the investment expense out of the Investment Income portion of the dividend rate to the expense portion.

****END OF EXAMINATION****
MORNING SESSION

Answer to 8

a. This strategy is totally different from Mercury's historical strategy. It involves new risk parameters & pricing goals & profit strategies very different from historical strategies.

Mercury has the financial strength to invest in new opportunities.

It has a strong brand name in general but low with the target market. It has significant market research base. They have no expertise in underwriting preferred risks.

Term products have thinner margins. Mercury needs to further analyze the competition. Can they compete in this market? Regulatory barriers need to be investigated further.

The internet channel may cause some hard feelings with the agents. Mercury needs a well thought out plan to integrate the channels. The bank channel development may interfere with the development of the internet channel.

b. Need to analyze and project risks from new products and channels to capital position.
Use recent experience and current outlook to identify risks
Need to perform a DCAT analysis
Mortality is a real risk but not substantial
Mortality could have ripple effect on persistency & competitive position
C-2 risk related to new class structure
Persistency risk is high; it's easy to lapse
Term is a very competitive product
C-1 & C-3 are not big risks
If new business volumes are too low, expense pricing problems. If it is too high, surplus strain greater and may not be able to grow other products.
May need to use more reinsurance with this product
Expense risk is major threat:

- inflation
- higher underwriting expense
- manage with premium increases, offset of other experience items or reinsurance

Reinsurance risk is low

- consider reinsurer insolvency or capacity reduction

Risk of government action is low but exists

- entry of other financial industries
- restrictions on allowable underwriting

Distribution channel risks

- loss of best agents
- inability to attract new market
- development costs may be more tan estimated

Answer to 9

a. (i) **Cash Flow Testing**

- interest scenarios: regulations specify certain prescribed scenarios
- may need to do stochastic testing
- can't tell probability with deterministic scenario
- start with current assets and yield curve
- choose model to move to next rate
- how do you handle positive and negative cash flows
- formula to relate modeled rate to credited rate
- interaction of credited rate with persistency

Mortality and Persistency

- use own company experience – seems credible
- otherwise look at intercompany tables
- both impacted by distribution through bank?
- sensitivity test assumptions
- relationship between lapses and mortality

Expenses

- use own company experience but consider validity of data
- consider administration, claims, taxes, overhead
- how do lapses impact expenses?
- particularly overhead
- how is inflation related to modeled cost?

(ii) **Illustrations**

- allowable assumptions defined under ASP 24
  - disciplined current scale
  - must not be self-supported (i.e. not involve a subsidy from elsewhere)
- interest based on recent experience
  - on portfolio or investment generation method
  - fixed for all durations
  - may be net of investment expenses
- mortality and persistency should be based on recent experience
  - may adjust for risk classes
  - trends may not assume future improvements
    - should show deterioration if indicated
- expenses – direct expenses – premium tax, commissions
  - others: a. fully allocated
    b. marginally allocated
    c. based on generally recognized study
  - if not using a, must use greater of b or c
  - changes? e.g. in commissions

b. (i) New preferred class

- will increase u/w costs
- may need system enhancements
- need to work with u/w and reinsurers regarding guidelines
- current mortality needs to be split into preferred/non-preferred
    - both classes should reproduce current experience
- use ratio approach or new mortality tables?
    - any industry experience
- may get new business from improved risks

(ii) Persistency bonus

- will cause increasing persistency up to year 15
    - spike in lapses after year 15?
- will need to change systems to administer this bonus
- how to fund this bonus? – increase target spread
- any industry experience?

- need to do sensitivity testing & need relationships with mortality, current crediting rate
- some states may not allow

Answer to 10

a. Primary Purpose/Financial Impact

(i) Solvency

- Protect policy holders interests in the company
- Assure company can meet its long-term obligations
- Regulatory assessment

Impact: large loss in year new business is written, regardless of overall profit

(ii) Income

- Allocate profit to period earned
- Emphasize income over solvency

Impact: profit or loss in first year, depending on deferrals of acquisition expenses, regardless of profit

(iii) Value

- assist with making economic decisions
- evaluate financial performance

Impact: report first year profit (loss) if pricing return > (<) hurdle rate. Immediately reflects impact of new business

b. Calculations to convert distributable earnings from solvency to income

Step 1: Calculate EGP's

- COI's – death benefits
- Administrative charges – actual expenses
- Investment income – credited interest
- Surrender charges – N/A here

Step 2: Calculate DAC Asset

- determine which expenses to defer
- calculate k = PV defer expense / PV EGP's
- DAC (t) = (1) ac (t – 1) + def $\exp^{(t)}$] * (1 + UL credited rate) – k * EGP(t)

Step 3: Calculate UREV

- similar calculation to DAC, just substitute unearned revenue for deferrable expenses

Use best estimate assumptions. Deferred Tax Liability

Income Based DE = Solvency DE + increase DAC – increase UREV – increase deferred tax liability – increase AV over solvency reserve

c. 200 VB Expenses (in millions)

1. Earnings on Adj. Stat from surplus
   = after tax earned rate * (GAAP from surplus – DAC)
   = 4.53 * ($70 - $521)
   = $20.295

2. Earnings on business in force at 01/01 / 2000
   = hurdle rate x value of business in force
   = 10% * $500
   = $50.000

3. Earnings on new business in 2000
   = solvency based earnings for 2000 + PV future DE's
   = $105.282 + $100.000
   = $5.282

d. Evaluate UL Growth Objective

(i) Market Targeting/Segmentation Strategy

- Wealthy/retireds likely effect segment for growth
  1. Measurable – size & characteristics
  2. Substantial – America is getting older
  3. Accessible – AARP, geographic location
  4. Differentiable – different needs than younger workers
  5. Actionable – Mercury success with UL
- Single segment with one product – dangerous to place one bet
- Segment could shift to other products or tax law could change

(ii) P/Q

- high/high
- career agents a strength
- can't compete on price alone against low-load products
- cheaper products could gain quality reputation – gain market share

(iii) Profit/Management

- short-term: corporate projection shows GAAP ROE 10%
  cost of capital & equity growth rate; generates free cash flow and economic value over short term

- long term: profit for new business UL only 8.95%; cash sink & destroy economic value; profit is a concern long term

e. Product Risks

- Mortality – exists; Mercury UL experience stable & favorable
- Morbidity incidental
- Persistency
  - biggest risk since no surrender charges (s/c)
  - negative impact on mortality
- Cash Flow Mismatch
  - duration could shorten quickly without s/c's
  - can't invest short & credit competitive rates
- Expense
  - ripple effect if lapse rates too high
  - risk in starting new distribution system
- Reinsurance – not material
- Government/Political – would likely hurt Mercury's competitors just the same

Answer to 11

a. Low initial premium leads to more competitive product
Policy fee is much too low; normally high for re-entry term
Renewal period is long; shorter (4-5 yrs) is better
Underwriting standards should be spelled out in advance
Lack of banding produces uncompetitive rates at higher face
Recommend adding banding to the product
Minimum face is very low for term
Recommend increase min face to $50K or $100K
Age setback for females inappropriate; use independent scale
Even so 4 years is too low; 6 years would be better
Range of riders is not competitive
Recommend additional riders: spouse, child, waiver of premium
Coverage expiry is ok
Conversion expiry is aggressive; it typically ends before coverage
Issue ages exclude younger ages which is a key market for term
Recommend min issue age of 20
Levelized commission
- may promote persistency
- but not designed to attract new business
- recommend increasing first year commission

b. Design may result in a rate spiral
Reinsurance is important due to large face amounts
Mortality assumption is important for term
Watch for renewal mortality: could lead to anti-selection lapsation
Mortality is similar regardless of policy size
Persistency impacts expense recovery
Expenses need to be amortized quickly
Must account for U/W expenses at renewal points
Expenses account for high % of premium
Consideration must be given to allocation of O/H expenses
Account for inflation
Account for conversion costs
Rely on more than one profit measure
- profit margin, IRR w and w/o TS, breakeven year

Answer to 12

a. Crediting Strategy:

- Crediting market rate produces more severe losses than earned rate less spread
- May result in borrowing spiral…losses financed through borrowing, which makes losses higher
- Unrelated to own earned rate, risk of not reaching target spread
- If credited rate equals market rate, then there are no excess lapses
- Competitors may be using different investment strategy or have different surrender charge structure
- Need to consider interest rates of non-insurance financial vehicles
- Could set at earned rate – target spread, yet be within specified range of competitors
- May need to invest in lower rated bonds to support credited rate based on market

Surrender Charge:

- Surrender charge is relatively low and period relatively short
- May lead to excess lapses and reduce duration of liabilities
- Acquisition costs may not be recovered from lapses
- Consider extending surrender charges for longer time period and raising them

Bailout Rate

- High risk of bailout being exercised
- If interest rates drop, higher number of lapses will occur
- Reduce bailout rate to initial credited rate – 100 basis points

Surrender charge free withdrawal:

- 20% is very high
- High free withdrawal makes asset-liability matching difficult
- Policyholder may leave for SPDAs with higher credited rate
- Reduce to 10% of account value, more in line with industry and encourages persistency

b.

- Can make statements about probabilities of financial results based on large number of scenarios
- Can better price the options, e.g. 20% surrender charge free withdrawal and bailout
- Measure risk associated with interest rate changes
- Becoming quick and automated
- Much better than using few, deterministic scenarios
- Some regulators require stochastic modeling
- Can measure effect of interest rate changes on other variables, especially lapses

Answer to 13

a. ASP 7 and ASP 23 contain sections on Reports and Communications
Describe assets and obligations tested
Describe model used
Describe scenarios used, their likelihood and rationale for their selection
Report on sensitivity tests performed
Materiality of biases found in flawed data, and adjustment made
Reliance on data supplied by others
Deviations from standards, their rationale and effect

b. Testing capital adequacy is subject to the DCAT Education Guide
Definition of capital and the target level
When stress testing, what is the standard of plausibility
When the significant levels of new business are expected
The company's competitive position in the individual life market
Any planned capital enhancements
Possible actions by regulators and rating agencies
The role of reinsurance
Anticipated changes in the law
Importance of ripple effects from assumption changes
Possible management actions

Answer to 14

a. Table III – Add Table I Cash Paid and Table II Claim Reserve Plus Liability

Incurral Year

	1995	1996	1997	1998	1999
1995	4,000				
1996	4,200	6,000			
1997	4,300	5,200	2,500		
1998	4,500	4,800	2,500	3,000	
1999	5,000	4,500	2,500	3,000	4,000

Reserve is adequate if the amounts are constant as we move down the column of incurral years. If amounts increase (decrease) reserves are insufficient (conservative).

Thus, reserves are insufficient for incurral year 1995. Reserves are conservative for incurral year 1996. Reserves are adequate for incurral years 1997, 1998 and 1999.

b.

- model assets and liabilities
- multiple interest rate scenarios
- reasonable and appropriate methodology
- reasonable experience assumptions
- best estimate assumptions
- reasonable results
- close approximation to a more detailed, traditional method

Answer to 15

a. Demand Elasticity is a change in the units sold for a change in price
Inelastic demand: demand hardly changes with a small change in price
Elastic demand: demand changes considerably with a small change in price
In this case, LOWCOST10 has a lower premium, so demand for TERM10 should decrease
The degree of change in quantity demanded is affected by:

awareness of the product (XYZ advertises heavily) – demand will be more elastic

quality sensitivity – if ABC is considered a better product, XYZ may not get additional sales, therefore inelastic demand

High income individuals will be sophisticated and will learn about LOWCOST10
Price elasticity also depends on the magnitude of the price change

b. Options

1. Maintain Price – ABC assumes it provides a better product or is a better company
   may not lose market share, because ABC is a market leader
   consider loss of market share and profits
2. Improve product keeping the price the same – add new features
   add a new feature and not charge for it
   i.e. preferred underwriting, realign banding
3. Match XYZ's price – since market is price sensitive, otherwise may lose some market share
4. Maintain current product, but introduce a low cost product to match XYZ's product
5. Change compensation structure (i.e. commissions)

Consider product life cycle and company's portfolio

**** END OF EXAMINATION ****
AFTERNOON SESSION