INSTITUTE OF ACTUARIES OF INDIA

Examination

Subject SP1 – Health and Care Principles

MAY 2025

INDICATIVE SOLUTION

Introduction

The indicative solution has been written by the Examiners with the aim of helping candidates. The solutions given are only indicative. It is realized that there could be other points as valid answers and examiner have given credit for any alternative approach or interpretation which they consider to be reasonable.

Solution 1:

i) The reasons for the actual experience of a PMI product to be different than that assumed in Pricing basis are as following:

- Lack of previous experience
- Variability of experience
- Changing mix of business
- Changing risk characteristics
- Anti-selection by policyholders
- Changing attitudes to claiming
- Climate effects
- Catastrophes
- Latent claims
- New types of claims- not explicitly priced in the product
- Claims inflation- more than assumed
- Legislative changes
- Judicial changes
- Regulatory changes
- Medical advancements not anticipated
- Poor claims management
- Poor Expense management
- Poor underwriting
- Frauds in claims

[4]

ii)

Incident Rate	2.50%											
Average Claim Size	27000											
Claim cost per life per year	675											
		2021 Q4*	2022Q1	2022Q2	2022Q3	2022Q4	FY2022	2023Q1	2023Q2	2023Q3	2023Q4*	FY2023
Lives Insured end of the quarter	1	19120	21345	38559	37272	45098		50345	48974	60904	73692	
Lives(Average)	2		20233	29952	37916	41185	**129285**	47722	49660	54939	67298	**219618**
No of Claims Expected	3=(2)* 2.5%		506	749	948	1030	**3232**	1193	1241	1373	1682	**5490**
No of Claims Actual	4		547	925	1087	1987	**4546**	1345	1296	1234	2878	**6753**
Incidence Rate Actual	**5=(4)/(2)**		**2.7%**	**3.1%**	**2.9%**	**4.8%**	**3.5%**	**2.8%**	**2.6%**	**2.2%**	**4.3%**	**3.1%**
Actual Claims in '000	6		13254	21974	33673	67073	**135974**	34253	34703	40053	104198	**213207**
Expected Claims in '000	7=(3)* 27000		13657	20218	25593	27800	**87267**	32212	33520	37084	45426	**148242**
Average Claim amount	8=(6)/(4)		24230	23756	30978	33756	**29911**	25467	26777	32458	36205	**31572**

A/E ratio	**9=(6)/(7)**		**97.0%**	**108.7%**	**131.6%**	**241.3%**	**155.8%**	**106.3%**	**103.5%**	**108.0%**	**229.4%**	**143.8%**

Following assumptions are taken

1. The rate of change in lives is same for all quarters
2. Entries (new policies) and exits(non-renewals) are uniformly distributed within the quarter
3. Seasonal variations are same in both years
4. The amount claims and settled are same
5. Reporting delay is one quarter

[6]

iii) Setting assumptions to determine expected claim cost per life per annum:

(i) Broad steps involved

- Investigate the historical experience and make best estimates of the parameters from that experience
- Consider what the conditions (including the commercial and economic environment) will be like in the future period for which the assumptions are to be applied
- Determine what the best estimates of your assumptions will be, given the expected future conditions. The extent to which one would rely on the experience data, and the extent to which you allow for other factors, including judgment, depends on the credibility and the relevance of the data, and how predictable the parameter is

(ii) Investigating the historical experience

- Claim cost per life per annum = incidence rate x average cost per claim
- The factors influencing the two components may vary and so they need to be considered separately
- Use past data subdivided by benefit/procedure class, age, gender, smoker status, occupation, distribution source, territory, region etc. as relevant
- Claims split by causes so as to get a sense of the size of claims for each cohort
- Analyse delay in reporting of claims
- Analyse the amount claimed vs. amount settled to predict trend of any fraudulent trends
- Consider the impact of seasonality in the claim occurrence (e.g. rainy season may show greater incidence of infectious diseases)
- Comparing the average cost per claim historically will give an indication of the likely medical inflation in the past
- Ensure the data is split into reasonably homogeneous risk profiles subject to credible data being available in each cell
- Period of investigation should not be too long to be less relevant

(iii) Adjust for the future – allow for:

- Medical trends – both level of utilization and the size of claims - new diseases, new methods of treatments etc. – consider past trends, medical resources demand and supply, Price and Earnings inflation etc., changes in underwriting, claim management
- Allow Changes in risk characteristics
- Regulatory changes
- Rate guarantees and the practical limitations on increasing premium rates

- Impact of reinsurance

[6]

iv) Calculation of Embedded value

Embedded value can be calculated as the sum of:

- **The shareholder-owned share of net assets, where**

  The net assets are defined as the excess of assets held over those required to meet liabilities. These assets may be valued at market value or discounted to reflect "lock-in", for example if they are required to be retained within the fund to cover solvency capital requirements, and

- **The present value of future shareholder profits arising on existing business**

  this would be the present value of future premiums plus investment income less claims less expenses plus the release of solvency reserves.

Other points for calculation of EV are

Calculations may be done using full data or model points:

- Future cash-flows will be discounted at the risk discount rate, reflecting the shareholders' required rate of return. Experience assumptions may be best estimate, but this depends on the purpose of the embedded value calculation. Tax is allowed for within the calculation as appropriate.
- It is important that the reserves used in the determination of net assets are the same as those used in the determination of the present value of future profits
- The starting point in deciding on a suitable basis will be the basis used for the previous embedded value calculation. Any differences will immediately cause some movement in the embedded value. Thus, any such change must be justifiable, especially if the embedded value is being used to report externally on a company's real worth.
- Embedded value basis might be more "best estimate" than is the pricing basis – incidence rate, claim size, medical trend and expenses. However, the two should be looked at side by side. Any differences will immediately lead to embedded value movements on writing new business different from those implied in the pricing basis.
- An embedded value calculation will consider the cash-flows across the portfolio in each time period, rather than the present value of cash-flows for each policy. The focus of an embedded value calculation is shareholder profit. Shareholders are interested in the present value of the actual distributions of profit that will be made to them in the future.
- For an embedded value, expected amounts of the shareholders' transfer each year are calculated, and discount these at an appropriate risk discount rate.
- An embedded value therefore takes full account of the cost of capital in the value of these transfers, because each year's transfer has to be made from profits that arise in excess of the supervisory reserves held.

[5]
[21 Marks]

Solution 2:

1. Improvements in recovery rates from cancer

- The impact depends on whether the cancer referred to is covered by the critical illness policy wordings.

- For accelerated critical illness, even if it is covered there is unlikely to be much change in reserve.
- Payouts will be unchanged, as the policy is not affected by recovery.
- For SACI, if this cancer is covered then it depends whether the rate of survival through the survival period is changed.
- If more people now survive the survival period, then the rate of payout will increase and hence reserve should rise.
- If it is the longer-term rate of recovery that improves, then the reserves will be unaffected as for accelerated critical Illness.However, claims may in fact reduce if the cancer definition is no longer triggered due to the appropriate severity level not being reached
  - For income protection the payments could be expected to be paid for a shorter duration
  - Policyholders may be more able to return to work on a part time basis with reduced benefits
  - If the policy has a long deferred period, a claim may be avoided hence reserves could be expected to reduce
  - Alternatively, benefits could be paid for a longer duration, for those cases where claimant could otherwise have died, hence reserve could increase
  - Similar considerations apply to PMI reserves: some patients may incur lower treatment costs due to quicker full recovery, and others may incur higher treatment costs if they might otherwise have died.

2. Sudden, unexpected, decrease in supply of hospital operating theatre nurses

- This would primarily affect the PMI reserves.
- If the reduction in supply of nurses caused the wage paid to the nurses to increase costs would go up.
- Hence the reserves would be expected to rise for claims already incurred for those cases involving surgery and claims not yet incurred the URR would go up
- However, the cost rise will depend on whether there are fixed rate agreements in place between the insurer and the hospitals.

- If the shortage was so severe that many operations were cancelled then claim costs could temporarily fall.
- but as the operations are still likely to take place at some point then it is unlikely that the company would release reserves
- It is possible that claims could rise if waiting list time increases lead to greater use of private insurance rather than relying on any state provisions.
- either due to waiting list clauses or personal choice (noting that private providers may be more likely to obtain replacement staff
- Cancellation of operations could similarly reduce recovery rates, increasing claim costs for income protection(with consequent increase in the reserves)
- Critical illness could be affected if falls in quality of care lead to increased rates of mortality in the survival period.
- This would reduce reserves slightly for SACI and for accelerated CI this could lead to slightly higher reserves.
- However, CI claims could increase if important surgery is missed which leads to more severe illness, which would indicate higher reserves.

3. Increase in take-up rates for cancer screening following celebrity Case

- PMI reserves would go up even more if the screening test were covered on the PMI policy
  .
- If the change caused diagnosis rates to increase, then accelerated critical illness pay outs could be brought forward, causing reserves to increase slightly
- This could similarly increase the rate of claim on SACI, causing reserves to increase, perhaps more significantly.
- SACI claim rates would also be increased due to more cases being diagnosed prior to death and if the CI policies are defined term, claim rates could be increased due to more cases being diagnosed prior to the end of the policy.
- If the treatment for the cancer was debilitating, this could increase claim rates on income protection
- Similarly the treatment could prolong life, but not in a sufficient level of health to return to work so IP reserves could possibly increase
- On the other hand if cases are picked up early as a result of the screening, they might be treated.
  before triggering an IP/CI claim definition, so claim rates and thus reserves could reduce

[12 Marks]

Solution 3:

i) There are four objectives of Health care benefits provided by government of a country

- Protecting the nation's health
- Subsidising the poor
- Balancing the budget
- Fulfilling social , cultural and political promises

A government can use following method to provide health care benefits to its citizen:

1. Government may provide full health cover to its citizens. It may be from cradle to grave cover for all.

    a. Such benefits would be too costly for a government to budget.
    b. Government may have imposed higher taxes to provide such cover
    c. May not be liked by those who are financially well off and are able to fund their health care expenses
2. Government may provide means tested benefits

    a. It means that government may provide full financial support to those who earn less than a given threshold
    b. The means test assesses the proportion of the total benefit that the State judges the individual should be able to provide from their own income and savings
    c. The means test assesses the proportion of the total benefit that the State judges the individual should be able to provide from their own income and savings.
3. Government may provide direct provision
    a. The government may provide its own medical establishments that perform the necessary treatments.
    b. Some of these costs may be charged subsequently to the patient alternatively
    c. the commercial healthcare system may provide the services and the government may reimburse the expenditure, either partially or fully

   d. Government can control cost of claim by having direct provision.
4. Government may provide direct provision
   a. Cash benefit can be in form of lumpsum benefits to the people
   b. Cash depends on the life stage of the recipient
5. Government may provide regular income in case of permanent disability
   a. Such benefits could be in form of flat benefit or salary related benefit
   b. Benefit may increase in line with some consumer price index

[6]

ii) How State healthcare can be more comprehensive than insurance cover

- A State system can provide care and treatment for both acute and chronic conditions. An insurer will find it difficult to cover chronic conditions because of the very high expected claims costs.
- A State system can allow cross-subsidy between individuals. The expected costs of an individual's benefits could therefore be significantly greater than what would be expected given their contributions
- Insurers can only allow cross-subsidy to a limited extent, especially in a competitive market
- A State system can make a 'loss', provided this can be funded from tax revenues or other sources.
- If insurers sell products at a loss, this can only be in the short term.
- A State system can provide benefits for those whose current state of health would make them uninsurable (eg those with genetically-related illnesses, or with HIV).
- Insurers would usually need to refuse insurance to such cases because of the high expected claims cost
- A State system can provide cover for those who have dangerous jobs (eg those in the fire service)
- Insurers might find it necessary to quote special terms for such people.
- A State system can provide accident and emergency services.
- Insurers may impose conditions, such as pre-authorisation and/or preferred provider arrangements, that would make it impractical (or impossible!) to cover accident and emergency services.
- A State system can provide benefits for individuals who would not be able to afford to purchase insurance themselves.

[4]

iii) Advantages

- Those over age 60 are frequent users of medical services
- Encouraging these people to provide their own care may relieve some of the demand on the State services
- . particularly if they seek treatment in private hospitals, and perhaps in hospitals in another State
- This will be of positive benefit to the State system if there is currently excess demand for medical treatment.
- The tax change is effectively a State subsidy on premiums. The cost of this subsidy may be less than the cost of treatment that would otherwise have been borne by the State.
- The premium subsidy may result in those over age 60 becoming more aware of their health, and taking better care of themselves.
- This will have the effect of reducing the long-term costs of medical treatment.
- t will be popular with taxpayers over age 60.

Disadvantages

- Tax revenues to the State will be reduced.
- if there are limited medical resources, particularly medical staff, this may have the effect of increasing funding for the private sector and attracting staff away from the public sector.
- This may force up the wage levels of medical staff, which could make the change more expensive than anticipated.
- It may undermine sympathy and support for the State system
- It will not be an incentive for all those aged over 60 because not all these people will pay tax.
- Those who pay tax will be the more affluent, and so the subsidy favours the better off at the expense of the poor
- Those under age 60 may complain or lobby for the subsidy to be extended to them.
- There are administrative costs of organising the subsidy
- Those who are close to 60 years of age might delay buying policies to get tax benefit

[6]

iv) The aim of regulatory restrictions is usually stated to be the protection of the policyholder. Following restrictions may be imposed:

- A restriction on the types of contract that an insurance company can offer
- Restrictions on the premium rates or charges that can be used for some types of contract
- Restrictions on rating factors that can be used to calculate premiums, for example gender or age.

- Requirements relating to the terms and conditions of the contracts offered, eg how paid-up policy and surrender values are to be calculated.
- Restrictions on the channels through which insurance may be sold, or requirements as to the procedures to be followed or the information required to be given as part of the selling process
- Restrictions on the ability to underwrite, for example a prohibition on the use of genetic test results or prohibition of use of past claims history or medical history

Impact of restriction on increase in premium for aged 60 and above:

- The premium charged from those aged 60 and above will not be sufficient to meet the claim cost and expenses
- To recover the lost premium insurer might increase premium for those below 60 more than the required increase
- This increases cross subsidy among policyholders
- Due to higher increase in premium those policyholders less than 60 might lapse their policies at a rate much higher than expected
- This deteriorates the experience and due to limitation on the increase in premium for policyholders aged 60 and above, further higher increase will be required for those less than 60
- Eventually the portfolio might be left with policyholders of 60 and above only
- Some insurer might realize this and create two premium tables . one for aged below 60 and other for above 60
- In above case those who buy policy below 60 and renew at or above 60 might face significant premium increases
- If allowed, insurer might restrict the entry age below 60 and do not renew policy beyond 60 years of age.

[6]

[22 Marks]

Solution 4:

i) Drawbacks of using formula approach for calculating premium for IP Product:

- Using formula approach, multi-state models are impossible
- It does not easily allow for the waiver of premium benefit
- It does not allow for separate inspection of premium related flows - We cannot track expenses, claims, premiums etc separately each year
- Formula approach does not allow for the accumulation of reserves - In fact, reserves are ignored completely when using this approach
- It does not properly allow for capital needs - It is not possible to allow for the desired rate of return required by shareholders on their capital
- It does not allow for the impact of net negative cash flows in any period - In effect we assume that any capital needed can be borrowed at the discount rate used. This is important for capital implications
- It does not allow for the variation in returns - The approach uses one fixed discount rate, whereas investment returns might vary over time
- It does not allow for changes in the assumed future experience and cannot be used to measure the sensitivity of profit to such variations.

[4]

ii) **B.** Assumption required to price IP product are following

1. Mortality among lives that in claims
    a. important because this has a bigger financial impact, and because the mortality of sick lives is a lot less
    predictable than for the population as a whole.
2. Since there is no death benefit, mortality of healthy lives is not important
3. Transition from healthy to sick, i.e. claim inception rate is a critical assumption
4. Claims termination rates
    a. combination of appropriate recovery and mortality rates
    b. the benefit will cease if the claimant recovers or dies or if the policy expires
    c. the rate of recovery or rate of continuation is crucial to the pricing
    d. recovery and mortality rates should not be overstated
5. Lapse rates
    a. early duration lapse – important due to negative asset share
    b. later duration lapse – important if there are surrender benefits paid which are greater than the asset share
    c. important if there is potential lapse and re-entry (due to premium rates falling)
    d. important due to potential selective lapsing (healthier lives lapse leaving a worsening propensity to claim
    among the continuing lives)
6. Expense assumption
    a. Important to allow for both direct and indirect expenses
    b. Should be consistent with the volume and mix of business assumption
7. Expense inflation
    a. Must allow for this in the pricing as we are charging a level premium
    b. Should be consistent with the investment return assumption
8. Commission and claw back

a. This will be based on an assumed mix of future new business by distribution channel
b. Claw-back assumption should be consistent with the lapse assumption

9. Investment return
    a. Being a protection product, the reserve is not likely to be large; however the investment risk is being
    borne by the insurer and this assumption is important
10. Business Volume
    a. By policy size - required because underlying experience vary according to the policy size. Larger policies
    tend to have better claim experience as the policy holders are likely to be from higher socio-economic
    groups and there is stricter underwriting for larger policies
    b. By distribution channel – different target market; different underwriting; different claim experience;
    different level of expenses
    c. By sex – required if unisex rates to be charged
    d. By region – risk vary between regions – eg. the IP risk can vary dramatically between a heavy industrial
    urban centre and an agricultural rural community.
11. Taxation- Allow for both current and expected future changes in tax rates
12. Profit Criteria- What is the expectation of shareholders?

[9]

iii) Sales director's suggestions

A. The policy term should extend to age 65 instead of the fixed 10 years

- It can help increase sales due to
    a. Age 65 – typical retirement age – so, will have greater appeal to policyholders because it covers the
    full typical earning period
    b. the 10 years term does not meet the needs of customers who look at the IP policy as a means of
    repaying mortgage which is typically of longer duration, say, 20 years
- On the other hand, the term of the policy could be too long to provide premium guarantee, a life aged 25 yrs
  will have 40 yrs team. This will mean the premiums rates will have to be reviewable due to greater
  unpredictability around future claim inception and termination rates – a premium reviewability clause may
  put off the customers and thus reducing sales. If we were to continue premium guarantee, the premium may
  become exorbitantly high due to the need to build contingent margins in the pricing and reserving

B. Benefit should be increased to 100% of the gross annual income

- This can help increasing sales as it will attract customers as it replaces the whole income during periods of incapacity

- However, the risk is that there will be no incentive for the claimant to return to work and thus increasing the claim outgo and the claim monitoring costs. The increased costs would make the premium unattractive and thus reduce sales
- Again the 100% gross income which is greater than the net (of tax) income that the policyholder would otherwise get will make the claimant better-off staying sick rather than return to work
- Also expenses in disability may be less than those in normal (working health) and so restricting benefit to
  60%-75% of net annual income may be a better deal
- It is also important to ensure that the income covers all sources of income, otherwise even a lower replacement ratio will not provide adequate incentive for claimant's to return to work
- The differences in the tax treatment of disability benefits and that of regular income will also needs to be
  considered while choosing the appropriate replacement ratio

C. Benefit should commence from day one of sickness

- This can help increasing sales as the benefit will be paid for short-duration sicknesses as well
- There will be more number of claims and for a longer period - increased admin and claim costs leading to
  high premium – will put off customers
- Also, greater scope for anti-selection and thus increased (claim) underwriting and administration costs -resulting in higher premium putting off customers
- There is also no real need for customers to be paid from day one – most policyholders would not want to submit a claim for a couple of days of flu
- We would need to consider ho long and how much is the state/employer sickness benefits so that the deferred period is set to make the policy complimentary
- On the other hand, a zero deferred period would encourage claimants to return to work as they will not have to serve another deferred period should the illness relapse shortly after return to work. This will reduce claim costs leading to reduced premium and increased sales.
- A better alternative would be to consider a linked-claims period where the deferred period is waived if the claim recurs within a specified period of time, say 4 weeks. This will encourage return to work and thus
  reduce claim cost.
- If the deferred period of one year is too long, then another alternative is to consider a split deferred period. For example, no benefit during the first 3 months, 50% benefit during the next 3 months and full benefit thereafter.

For all these suggestions, the following needs to be considered:
• What is the competition doing?
• Is there any market research backing these suggestions or they are driven by the broker's preference?
• How does it fit into the company strategy – breaking into the market as a loss leader?
• Any regulatory restrictions on these?

[9]

iv) Why company may not choose to reinsure and what are the risks of not reinsuring

Why not reinsure

- reinsurance is expensive or unsuitable
- bad experience dealing with reinsurers on PMI eg. disputes over large claim recovery
- worried about the financial strength of the reinsurers being low – risk of default
- lot of experience in medical underwriting and so do not think reinsurer expertise required on underwriting
- strong in house actuarial team or technical support from its international partners who have good experience with the IP product and so reinsurers expertise with pricing not required
- launching the product on a limited scale (to test the water) and planning to sell only restricted volumes and so the company believes any claim volatility is manageable
- large company, may have huge free assets and so willing to take the risk
- has had success in setting up risk fluctuation reserve instead of reinsurance at much cheaper cost and so wants to adopt the same approach for the new product
- is not an indemnity product and so upside claim potential is limited – so believes that reinsurance risk/profit transfer is inappropriate.
- no or very little tax/regulatory capital arbitrage using reinsurance

Risk of not insuring

- new product with no data – local factors not built in – risk of mispricing without technical support from reinsurers – though actuarial consultants may help with this
- product poorly designed (eg. loose claim definitions) and hence the risk of not being able to reinsure at a later stage when the portfolio gets bigger and accumulation risk becoming material
- risk profile is quite different from that of PMI – so, risk of getting underwriting wrong – policy holders taking advantage of this and select against the company,
- or the risk of having to decline more cases with lack of expertise on substandard lives' underwriting – may lead to bad publicity and poor sales
- not getting reinsurer support when expanding to Group IP business (where the accumulation and catastrophe risks may mean reinsurance is necessary)
- with poor design – may not get reinsurer support when the regulatory/tax regime change making reinsurance a compelling proposition.

[5]
[27 Marks]

Solution 5:

i) Impact of 'anti-discriminatory' legislation on health insurers

Insurers will no longer be able to use age or gender as rating factors in their pricing. The impact of this depends on the extent to which age and gender are currently used as rating factors, if at all.

This may depend on

- The insurers' culture
- The level of competition in the market
- The product being sold

For example, in some territories age, but often not gender, is used for rating PMI

but, in more competitive markets, some insurers have started using a number of rating factors including age and gender (if this is permitted by legislation)

and often neither factor is used for rating health cash plans.

Those insurers who made best use of age and gender as rating factors will be most affected as they will no longer be able to benefit from this advantage

There will be cross-subsidies in those insurance products where the risk depends on age and/or gender.

For example, under PMI younger policyholders will subsidise older ones (as older policyholders generally claim more)

This will result in reduced profits from the riskier (eg old) customers, but higher profits from the less risky (eg younger) customers.

However, the resulting price increases that will be imposed on the better risks may force these customers not to renew their policies, and policies will now be more attractive to riskier groups.

This will result in anti-selection and higher overall expected claims.

The level of lapses will depend on how important individuals feel it is to have coverage against a particular risk.

One factor here will be the current health of the customer – those in worse health will be more likely to stay, thus increasing the anti-selection effect further.
However, the changes are not likely to impose great anti-selection problems to one particular health insurer, because the whole market is affected.

This is because it will be as difficult for the better risks to get cheaper cover from another insurer, except to the extent that customers are able to buy cover from insurers based in another country not affected by the new legislation

As well as offering the same premium, insurers will have to offer the same benefits to all customers, regardless of age or gender. For example, they would not be allowed to offer different levels of cover or excess levels to different age groups.

Insurers will not be able to restrict coverage to one gender or another (eg 'male only' PMI) or place minimum or maximum age limits on cover.

This means that insurers may need to take on risks previously deemed to be unacceptable (eg new cash plans to elderly customers).

Insurers will not be allowed to explicitly sell products to a target gender or age bracket, for example by solely emphasising the benefits of the health insurance, to young people in the marketing literature, without mentioning other sectors of the population.

So, certain specialist insurers will no longer be able to sell to a particular niche market

which may result in loss of business since customers no longer feel that the insurer is treating them as being 'special',

[7]

ii) Following actions can mitigate the impact

- Insurers may be able to use other rating factors as proxies to age and gender,
- for example, there may be a correlation between the occupation and the age/gender of customers.
- Similarly, they might introduce exclusions that do not directly exclude certain ages or gender, but will reduce the number of undesirable risks
- for example, excluding treatment for specified conditions, such as hip replacements, that are more likely to affect older people.
- Insurers could change the product design,
- for example, if only fixed-sum cash benefits were offered this would reduce some of the age-related impact on claims costs (because, under PMI, average claim costs tend to increase with age)
- Alternatively, they could place a maximum on the total claim amount payable per policy year
- or introduce NCD systems that should result in charging higher-claiming policyholders (who are likely to be older lives) higher premiums indirectly.
- Insurers could implicitly target the market where the risk is lower, eg through advertising in magazines that are mainly read by young males.
- Care will be required here, as the insurer could still be accused of discriminating, albeit implicitly.
- They could alter the policy design to include features that will be more attractive to the preferred market,
- for example, a PMI policy that offers childcare benefits may attract more 20 to 40 year old policyholders
- or a policy that covers claims relating to certain cancers only, eg breast and cervical cancer.
- Overall, insurers should consider the effect that the changes will have on each product's expected future customers, and allow for the resulting changes (both volumes and mix by age and gender) as accurately as possible in both business planning and pricing calculations.
- They could market aggressively or have advertising campaigns to promote the benefits of health insurance (in spite of the changes).
- Insurers could implement general risk management techniques in order to manage their risks, eg buying (more) reinsurance or increasing margins.

[5]
[12 Marks]

Solution 6:

Data Risk faced by Health and Care Insurance

Issues in data

- The data is not properly captured by IT system giving risk of incomplete data
- The data even if captured is inaccurate.
- Not all data captured giving rise to inadequate data.
- Policy level data has missing fields
- Issues in claims data like incorrect date, etc.
- Issues in legacy data system

Risk due to issues in data

- Unreasonable assumptions are taken for pricing such as
  - Morbidity rate
  - Medical inflation
  - Expense inflation
  - Persistency rate
- Due to above, inadequate premium is charged from insured
- Leads to losses to insurer

- Under/over reserving for liabilities such as
  - IBNR
  - PDR
  - Free look reserve
  - Reserves for product with options and guarantees
- Profits being delayed/accelerated due to under/ over reserving

- Incorrect calculation of commission to sales force
- Unreasonable allocation of capital for different lines
- Incorrect report to regulator which might invite attention from regulator

[6 Marks]

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