Institute of Actuaries of India

Subject SA3 – General Insurance

March 2022 Examination

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 Product Management Committee (PMC) is set up to:

- review all the products offered by the insurer and recommend if they should continue to be offered or should be modified/withdrawn.
- recommend new products to be filed with the IRDAI.

[0.5]

As per the IRDAI's product filing guidelines for general insurance products, the PMC is responsible for undertaking due diligence of products offered or due to be offered to ensure that they comply with product design principles and protect policyholder's interests. [0.5]

There are two products under consideration – Retail Health insurance which will fall under Use & File application process while Workmen's Compensation insurance is considered as a Commercial insurance product and will fall under File & Use application process.
All products under File and Use procedures need thorough scrutiny and recommendations made by the Product Management Committee of the insurer.
The PMC is expected to play the most important role as far as Use and File Procedures are concerned because of the self-governing nature of the process.
The PMC is usually constituted by the Appointed Actuary, Chief Underwriting Officer, Chief Financial Officer, Chief Marketing Officer, Chief Risk Officer, Compliance Officer and Head of Reinsurance and each member's role is briefly outlined below [2]

Appointed Actuary
To ensure a robust and fair pricing framework, to analyse the financial implications of risks insured under the product, to assess the impact of the product on the insurer's solvency and capital position and to ensure that necessary due diligence is carried out in the product development process.

Chief Underwriting Officer
To ensure that policy terms and conditions are true and fair and meets policyholder needs, to ensure that the product complies with the Board approved underwriting policy and that the product satisfies all basic principles of insurance.

Chief Financial Officer
To ensure that commission structure of the product is line with regulations and to work with the Appointed Actuary to ensure that capital requirements are met.

Chief Marketing Officer
To identify customer segments to whom the product will be marketed, distribution channels through which the product will be sold and business volumes expected.

Chief Risk Officer
To ensure that the product complies with the Board approved risk management policy. To coordinate with the Appointed Actuary, Chief Underwriting Officer and other product stakeholders to identify and quantify non-insurance and residual risks and to recommend an effective mechanism to minimize these risks.

Head of Reinsurance

To ensure reinsurance coverage for the product and that the terms and conditions of the product do not conflict with existing reinsurance arrangements

Compliance Officer
To ensure that the product does not breach any of the applicable laws, regulations and extant guidelines, circulars and directions

[Max 6]

ii) The key role of the Appointed Actuary at the product development stage is to carry out thorough due diligence to provide an unbiased opinion to the company management, in this case to the PMC.

The basic approach to assess both the products would be similar barring few specificities. Below is the list of steps which can be followed –

- Understanding the objective behind developing the product [0.5]
- Make an assessment about the products' positioning in the context of the company's overall strategic objective. The Company is a medium sized insurer – it would be extremely important to assess the financial implications of such products, especially a high sum insured health indemnity product which is likely to have high claim costs. [1]
- Understanding the product features and generating preliminary views around the pricing approach should there be a decision to go ahead. [0.5]
- Does the company possess the requisite skillset to develop such products? It has relatively limited volumes of Individual Health insurance business and hence past experience may certainly not be adequate. Similarly, Workmen's Compensation will be a completely new line of business, so underwriters will also need to be upskilled. [1]
- Product comparison - comparing similar products in the market and investigating product performance through market research [0.5]
- Target market and segments need to be well understood for both the products. While for health insurance product it would be important to have clarity around this in order to avoid significant overlap between products, in case of Workmen's Compensation, risk of accumulation in a particular geography or industry would impact product performance. [1]
- Challenges in pricing – in the absence of experience, a lot will be dependent on futuristic assumptions. In situations where the operating environment is replete with pandemic induced uncertainties, it will be difficult to make long term assumptions. Health insurance product needs to be filed through File &Use and no revision can be made prior to completing three years since product launch [1.5]
- Availability of suitable reinsurance at reasonable terms and conditions. [0.5]
- As far as Health insurance is concerned, it is important to analyse product synergy. It may be possible that the Company already has indemnity products and hence it is important to consider how the new product will be positioned against existing ones. [0.5]
- Pricing expectation – the CEO has asked to explore the feasibility of the high SI indemnity product being at a low cost, hence it is essential to assess whether such a proposition is technically justifiable based on expected claims experience and how the pricing will compare against other Health indemnity products. [0.5]
- Pricing flexibility in Workmen's Compensation insurance – the Chief Technical Officer's recommendation is likely to be influenced by growth potential. Hence in this case also, the Appointed Actuary should assess the expected financial impact as many a times unchecked growth contributes to higher than expected claim costs. [1]
- Distribution – If the products are launched, it would be important to factor the distribution mechanism in pricing in the form of expenses and acquisition costs. [0.5]
- System development – although the Health product may not need a new system, the same may be required for Workmen's Compensation. Such upfront investment costs will also need factoring in the overall proposal. [1]
- Business projection – Usually three years' business projections would be required to assess the capital requirements and impact on solvency. [0.5]
- Regulatory implications – the Appointed Actuary needs to be aware of any changes in the regulatory landscape which may affect product features/exclusions etc. and potentially the claim experience as well. [0.5]

[Max 7]

iii) **Individual Health insurance indemnity product**

Merits:

- Given the increased awareness about Health insurance in the population, the Company could expect to underwrite good volumes of business for this product
- The product proposes a very high sum insured at a low cost which is expected to be an attractive proposition from a customer standpoint.
- Although the sum insured is Rs. 1cr, claim severity could be relatively lower if product benefit limits and sub-limits are appropriately determined. Further, if this product is priced appropriately, it not only could be financially viable but also a key contributor to business growth.
- If not already available in the market, the Company can significantly improve its competitive position.

Demerits:

- There can be issues relating to product synergy. The existing products have already set a benchmark price against which the price of the new product will be compared. If the new product is inferior with a higher price point, then such a proposition would be difficult to implement.
- High risk of anti-selection. The product may prove attractive to a cohort of new customers for whom future experience is likely to deteriorate. Further, a behavioural change in customers is likely, which would eventually impact claims experience. For example, customers might go to better hospitals as compared to earlier owing to the high indemnity limit of the new product and this will negatively impact claims cost.
- If the product is not new to the market, the Company will face pricing challenges and competition. Lower than technical prices can bring growth at the expense of high claims cost. On the other hand, the Company might not be able to get the intended business growth if priced uncompetitively.
- Fraudulent and fabricated claims might also increase. The Company may need to invest more in fraud prevention.

Overall, in Health insurance, the Company is committed to a lifelong association with the insured and hence such a product needs to be viewed from a long term perspective. If new business volumes are lower than expected over the course of time, the Company will be left with a renewal portfolio of ageing customers who will be more susceptible to high claim costs and this might render the product unviable.

Workmen's Compensation

Merits:

- A new business segment could aid in achieving the Company's overall growth objective
- Given that the Company has historically underwritten Motor and Fire insurance business, Workmen's Compensation might well provide some diversification benefit.

Demerits:

- It seems that the product proposition is more influenced by the underwriting flexibility rather than any sound business plan. Many a times such pricing flexibility is used as per underwriting discretion without adequate data backing. Inappropriate use of such pricing flexibility can affect the product performance adversely. As the recommendation is aimed towards rapid growth in the segment, it is expected to be more based on discounting the technical rate which can result in sub-optimal pricing.

- Workmen's Compensation is exposed to latent claims as new diseases and conditions are discovered that relate to the working environment. It will also be difficult to predict if reinsurance cover will be available for latent claims emerging in future and also to estimate exposure with a degree of certainty.
- Industrial diseases e.g. asbestosis take a very long time to develop fully, there are usually extensive reporting delays. This will make it more difficult for the Company to manage this portfolio
- Given that this is a new lines of business for the Company, underwriters might lack the necessary technical expertise which might lead to unprofitable business being underwritten.

[Max 7]

iv) Rating process in Commercial lines of businesses varies markedly compared to retail lines of business. This is largely on account of the heterogenous nature of the business which makes it difficult to establish a statistical rating framework. Inadequate data at a granular level makes rating in Commercial lines of business more subjective and dependent on underwriter's judgement. [1]

For example, in case of Workmen's Compensation pricing, annual payroll is considered as the exposure measure, but there are several other risk and rating factors which affect the final rate. They are type of industry, skillset of the workers, safety measures adopted, hazardous activity undertaken and materials used, terrain of site, extent of automation, past claims experience etc. As a result, the final price varies considerably based upon underwriting assessment of these parameters. Further, commercial discounting also varies on the group size and potential business opportunities in other segments. [1.5]

Regulatory guidelines around rating flexibility-

Pricing flexibility may be allowed by Appointed Actuary to the extent filed with IRDAI as part of the product filing. The pricing deviation allowed is reviewed by Appointed Actuary annually and the PMC is informed to take necessary corrective measures, if the combined ratio of the product exceeds 100%. [1]

Any discount or loading to base premium rates should be based on objective and explicit criteria relating to assessment of risks being insured and should be such that there is no discretion by the insurer in assessment of identical risks. [0.5]

Challenges –

It is difficult to put very objective criteria on some of the parameters which form the basis of discount or loading. [1]

[Max 5]

[25 Marks]

Solution 2:

i) IFRS 17 will allow insurers to value their liabilities at market value and allow insurers to use a more uniform approach to metrics and reporting of financial information [0.5]

It measures an insurance contract by breaking it down into blocks such as

- Future cashflows that arise from the provision of insurance contracts
- Discount rate to reflect the time value of money
- A risk adjustment element for non-financial risks
- Contractual Service Margin (CSM) that represents unearned profit [1.5]

IFRS 17 will strengthen the balance sheet of insurers and offer more protection to policyholders. By bringing the valuation of insurance contracts in line with both the assets that back them and valuations undertaken in other industries, IFRS 17 will initiate better product design, less volatility and greater transparency. This will aid investors in valuations of general insurance companies as they will have more clarity on the inherent risks. [1]

It will ensure consistency in reporting globally. This will be helpful for global insurance companies having subsidiaries in India. It provides a true reflection of profits as compared to the existing accounting standards and aims to reduce volatility in company's financials [1]

Optional simplified model for future cover based on simple premium calculation for contracts up to one year. However, many general insurance contracts can be multi-year and that would result in a significant change in unearned premium calculations. [1]

One advantage of IFRS 17 is the categorization of the portfolio into different classes, basis the expected profitability. This entails calculating future cashflows from the portfolio and assigning probability weights to them. This provides a more thorough understanding of the types of risks underwritten by the company as contracts which are expected to be onerous will have to be provisioned for losses at the start of contract. [1.5]

The early recognition of profit or loss may also change the company's underwriting philosophy. [0.5]

Management information and their key performance indicators will change and will need to be aligned to the new accounting system. [0.5]

There will be operational implications due to implementation of IFRS 17. More granular data will need to be captured. Changes in the internal IT systems, accounting systems and actuarial reporting systems. Organisations will incur significant implementation costs.
Technical and functional training of resources [1]

The unexpired premium reserve may undergo a change and may move to being a best estimate of future cashflows with suitable risk adjustment, discounting and having a contract service margin. Similarly, the liabilities for claims (IBNR/IBNER) will also undergo a change [1]

Changes to yield curves will require better asset liability matching to manage income statement volatility [0.5]

Principles apply to all direct insurance contracts and separately to outwards reinsurance contracts held. This could lead to mismatches and traditional gross to net approaches may not be appropriate. [1]

Recognition of profit over time will change due to new best estimate valuation model, unwinding of discount, release of risk adjustment, release of CSM (under General Measurement Model) or recognition of earned premium (under the Premium Allocation Approach). Any losses, e.g. from groups of loss making contracts, however, must be recognised upfront. [1.5]

Traditional measures such as Gross Written Premium, Net Earned Premium, Unearned Premium Reserve and Deferred Acquisition Costs will no longer appear under IFRS 17. Income statement will simply comprise "insurance contract revenue" (a revenue measure to represent the transfer of services under insurance contracts), incurred claims and other expenses. The effect of changes in discount rates and discount unwind is reported as 'insurance finance expenses' alongside investment income. [1]

There will be subjectivity in the categorization of portfolios required for onerous contracts and the Contractual service margin. This is a critical assumption because it may lead to greater upfront recognition of loss making contracts. [1]

For most General insurance contracts, IFRS 17 using the Premium Allocation Approach might sound similar to existing accounting frameworks, but with several key differences:

- Use of "mean" rather than undefined "best estimate" for incurred claims
- Discounting of incurred claims through finance at statement date rates for the balance sheet
- Option to use rates at incurred loss date for the income statement (OCI Option)
- A "risk adjustment" reflecting uncertainty in amount/timing of unpaid claims
- Earned revenue pattern based on the timing of expected incurred losses [2]

Other key differences include ceding commissions being netted against reinsurance premiums and exclusion of the deposit component from revenue and claims incurred expense e.g. Deferred Acquisition Costs [1]

[Max 11]

ii) In IFRS 17 terminology, Outward reinsurance will be termed as Reinsurance held and inward reinsurance as reinsurance issued.
Reinsurance contracts held (outwards reinsurance) are treated as separate contracts to the underlying insurance contracts issued. This means that the accounting treatment of the reinsurance contracts held is determined separately from the underlying insurance contracts issued. [1]

The coverage period of the reinsurance contracts held could be different to the underlying contracts they cover. [0.5]
Premium allocation approach eligibility is assessed independently for the underlying contracts issued and reinsurance contracts held. This means that the reinsurance contracts held could adopt the general measurement model when underlying contracts could adopt the simplified approach. [0.5]
Level of aggregation for reinsurance held is determined separately (and possibly differently) to the underlying contracts issued. [0.5]

Reinsurance arrangements need to be differentiated by proportional and non-proportional coverages. [0.5]

Start of contract boundaries for reinsurance arrangements are defined as:

- Proportional coverage: Later of the beginning of coverage for the group of reinsurance contracts and initial recognition of the underlying contracts
- Non Proportional coverage: Beginning of coverage for the group of reinsurance contracts [1]

Present value of future cashflows should reflect the risk of non-performance by the reinsurer and should be measured using consistent assumptions as those used to measure the underlying contracts to the extent relevant [0.5]

Initial recognition of profits and losses are different for proportional and non-proportional cover in case of reinsurance contracts covering onerous underlying contracts [0.5]

Insurers will need to separately identify mandatory and voluntary reinstatement premiums in order to book them to the relevant premium/recoveries accounts [0.5]

Changes in the accounting treatment of reinsurance commissions depending on whether the commission is contingent on claims or not e.g profit commission [0.5]

[Max 5]

iii) All General Insurers underwriting fire and allied perils insurance business are allowed to file their risk and pricing and methodology with the IRDAI basis which they can move away from tariffs. These guidelines came into effect from 1st April 2021 and apply to all general insurers operating in India. [0.5]

The guidelines prescribed three standard products to be filed under the retail category, namely

- Bharat Griha Raksha
- Bharat Sookshma Udyam Suraksha
- Bharat Laghuudyam Suraksha

Earlier the coverage was being offered under Standard Fire and Special Perils (SFSP). [1]

Bharat Griha Raksha

- Standard product for Home building and contents in India irrespective of the sum insured
- Policy duration will not be more than 10 years
- No excess will be applied except on Terrorism cover
- Terrorism cover will be mandatory for all risks
- Waiver of underinsurance

Additional coverages are also being offered when compared to SFSP

- Theft cover where the claim is notified within 7 days of occurrence and caused by perils covered
- 10% escalation of sum insured every year up to a maximum of 100%
- General contents covered up to 20% of the total sum insured subject to a maximum of INR 10 Lakhs
- Loss of rent
- Rent for alternative accommodation
- Change in limits for architect and surveyor fees and removal of debris

[1.5]

Bharat Sookshma Udyam Suraksha

- For all risks other than dwellings and where the sum insured is up to a maximum of INR 5 crores at risk in any one location at the policy commencement date
- Excess of INR 5000/- for every claim
- Terrorism cover defaulted
- Policy duration will be 1 year

Significant changes from SFSP are

- Theft cover where the claim is notified within 7 days of occurrence and caused by perils covered
- Temporary removal of stocks up to 10% of stock value
- Start up expenses up to INR 1 lakh
- Professional fees of architects, surveyors and consulting engineers up to 5% of the claim amount
- Removal of debris up to 2% of the sum Insured

[1.5]

Bharat Laghu Udyam Suraksha

- For all risks other than dwellings and where the sum insured is between INR 5 crores (inclusive) and INR 50 crores maximum value at risk in any one location at the policy commencement date
- Excess of INR 10,000/- for every claim
- Terrorism cover defaulted
- Policy duration will be 1 year

Significant changes from SFSP are

- Additions, alterations or extensions covered up to 15% of the sum insured
- Loss to stock temporarily removed to other premises for fabrication, processing or finishing up to 10% of stock value
- Start up expenses up to INR 1 Lakh
- Underinsurance waiver up to 15%

[1.5]

Implications of the standard product

Every insurer needs to file their own rating schedule as compared to the standardized IIB pricing for FLEXA risks. Since Terrorism cover is defaulted, this will increase the premium ceded to the Terrorism Pool.

Since every insurer will have its own rating schedule, the reinsurance arrangements and cost will also change as all treaties were designed in a way to allow ceding of risk at IIB rates for FLEXA risks.

Reinsurers might restrict coverage for certain perils or stipulate a minimum rate as competition and de-tariffication might put a downward pressure on price. Reinsurance commission might reduce due to this.

Reinsurers might also introduce a profit commission clause to incentivise insurers to maintain portfolio loss ratios below a pre-determined threshold

Insurers may increase their net retention if reinsurance coverage is likely to be restricted and this in turn will have capital/solvency implications for the insurer.

[2]

[Max 8]

[24 Marks]

Solution 3:

i) The following are the key implication of climate change for the general insurance industry:

- Changes in climate related risk
  Changing weather patterns and climate will impact property and agriculture related losses through changes in frequency and severity of flood, storms, drought, hail and other climate related events. These changes need to be modelled and allowed for in all aspects of the business i.e. pricing, reserving and capital modelling.

- Some types of insurance may become less affordable
  Insurers typically charge higher prices for risks where there is greater uncertainty around the frequency and severity of weather events. For some types of insurance, the uncertainty around climate risks could lead to prices that few customers or businesses could afford and lower rates of insurance penetration.

- Diminishing market and Impact on growth
  The return period of catastrophic events is getting shorter as compared to few years ago. Such events impact certain regions (coastal areas) or product segments as a whole (crop insurance). Insurers may find losses from these events to be unsustainable. An insurer which may have underwritten significant volumes of crop insurance in the past, may have to reduce exposure or completely withdraw to minimise losses. While this will impact business growth adversely, it will also create wider social and reputational issues

- Greater accumulation of risks
  The risk of over-exposure to a single (climate-related) event may increase as significant weather events become more common and/or more severe e.g. increased frequency of cyclones, drought, flood in some areas will render them uninsurable and might require Government intervention by way of formation of a Pool similar to the existing Terrorism Pool.

- Latent claims
  At some point in the future, liability claims relating to climate change could emerge with some latency which will affect the general insurance industry. Insurers and reinsurers will be exposed to potential losses from liability insurance provided to Corporates that may face litigation alleging damages from carbon emissions and from companies' failure to disclose the risks of climate change. These policies could lead to significant accumulation risk across multiple insured clients and products.

- Adverse selection against insurers
  Those insurers who do not adequately account for weather events in their pricing models may be more susceptible to adverse selection by policyholders as their premiums might be significantly lower than their competitors who factored in natural peril pricing.

- Changing morbidity risks
  Changing climate may alter the distribution or prevalence of both infectious and non-infectious diseases like malaria and asthma in insured populations.

- Changes in population density
  Climate change could lead to rapid changes in population density of different geographic areas e.g., due to mass migration because of water shortages or floods. Populations that have either shrunk or increased dramatically because of migration could have very different risk profiles than observed previously e.g. different demographic profile, socio-economic status etc.

- Greater capital requirements
  Climate change could lead to greater capital requirements for general insurance companies because of the increased frequency and severity of extreme events combined with the risk climate change poses to assets.

- Impact on reinsurance
  Climate change will impact reinsurance availability and costs which in turn will force insurers to either increase their net retention or refrain from underwriting risks in specific geographic locations due to non-availability of reinsurance. This will have solvency and capital implications for insurers.

[Max 5]

<u>Impact on Pricing, Reserving and Capital Management:</u>

Due to the huge uncertainty surrounding climate change and its future impact on the world, there is a risk that the different models used by actuaries to calculate premiums, reserves and capital become outdated and do not adequately reflect emerging risk. This is nothing but model risk.

<u>Pricing</u>

- Pricing mostly relies on projections from past data and adjustment around anticipated changes in the frequency and severity of events that give rise to insurance claims. Climate change will increase uncertainty about trends in the data and the degree of confidence that can be placed on those projections.
- Challenge is to properly design and price products in light of climate-related risks and the needs of relevant stakeholders including customers, shareholders, regulator, investors etc.
- Many general insurance products are annually renewable contracts. Therefore, it may be tempting to assume that slow gradual changes in the climate will be experienced and only small differences in premiums will be needed to reflect those changes. But that may not be borne out in practice and may result in significant fluctuations in product performance.
- Internal pricing data will need to be supplemented with external data, reinsurance data to validate emerging trends

[2]

<u>Reserving</u>

- Most reserving techniques for established lines of business place some reliance on past experience. However, as is the case with pricing, climate change will increase uncertainty about the future, reducing the reliance that can be placed on such data.

- Important aspect is to identify climate related drivers that might affect claim frequency and severity.
- Climate change may alter mix and development of claims.
- In the current regulatory regime, where reserves are undiscounted, conservative assumptions towards the impact of climate change can add extra pressure on the Company's P&L account in the short term.
- It may be more appropriate to carry out impact analysis in the form of potential scenarios, from which deterministic actuarial best estimates may be selected. Sensitivity tests can help highlight the range around that best estimate.

[2]

Capital Management

- Climate change can impact future business strategy. By incorporating climate change impacts into its modelling, a firm can identify potential vulnerabilities and explore the feasibility of its existing and alternative business strategies.
- A stable capital position may be desirable to ensure consistent level of protection for policyholders over time, as well as a predictable return on capital for shareholders. However, due to greater uncertainty, insurers may need to explore a range of stress tests and loss scenarios, to determine the potential impact on their capital from climate change and identify the different risk mitigation strategies
- Climate change will increase reinsurance costs which in turn will need to be factored in pricing. This will negatively impact business volumes which will likely create capital strain.
- Climate change might also impact the investment portfolio of insurers as they reduce exposure in more volatile asset classes like equities and maintain increased liquidity. This will contribute to lower investment returns than observed in the past.

[2]
[11]

ii) The risks from climate change are often classified into physical risks, transition risks and liability risks.

Physical risk – these risks arise from weather-related events. Insurers may be exposed to physical risks through insurable events or through their asset portfolios. As such, many of these might affect a general insurer's balance sheet through both its assets and liabilities.

- Heavy rainfall and flooding will affect the property insurance risk
- Droughts, flood, wildfires will lead to crop damage, thereby impacting the crop insurance business
- There can be infrastructure damage leading to business interruption

Transition risk – these are the financial risks arising from a move to a low 'carbon emission' economy. Transition risks can arise from economic, political or social changes due to efforts to mitigate climate change, especially if these changes occur rapidly.

- Changes in motor liability risks posed by a move away from fossil fuels.
- Loss of market value and/or investment income within investment portfolios, where investments are exposed to the risk of stranded assets
- Increased product liability as a result of technological changes supporting the transition to lower carbon emissions e.g., overheating of energy storage batteries causing explosions, defective batteries powering electric vehicles

Liability risk – these risks arise from parties who have suffered losses and seek to recover those losses from those they believe are responsible.

- If insured parties are being held responsible for the physical impacts of climate change, such as through emissions of greenhouse gases.

- If insured parties (or insurers themselves) have not sufficiently disclosed information relevant to climate change or have done so in a manner that is misleading or have otherwise not complied with climate change related legislation or regulation.

[6]

iii) Usually an experience rating approach works well for events which are frequent in nature, in other words, high frequency and low severity risks.

Differences between the output of the Company's experience rating model and the expected Catastrophe model can arise due to:

- Catastrophic events are low frequency and high severity. So, while the experience rating model can give reasonable results in case of attritional losses, it may not be suitable for cat losses.
- The observed losses may not be reflective of the true underlying risks as the period over which losses have been observed may be much shorter than the return period of the losses under consideration.
- Every specific loss event may not have impacted the insured's portfolio and hence cannot be modelled through experience rating.
- Assumptions used in the experience rating model are likely to be different from the catastrophe model.
- Catastrophe models will draw on data from multiple geographies within the country where the insurer may have limited or no exposure thereby providing more credible damage/exposure curves for analysis.

[Max 4]

iv) Potential challenges the company might face while utilising catastrophe model outputs include:

- Company may not have sufficient knowledge of the catastrophe model in-house to interpret the outcome appropriately. It may lead to wrong conclusions being drawn.
- There is no single model that is best to cover all cat risks – it may be appropriate to use certain models for certain perils or use other vendor models to validate output and check sensitivity of the results.
- There could be elements that are missing from the catastrophe model like unmodelled contracts in modelled classes; unmodelled secondary perils of a modelled loss etc.
- There might be unmodelled perils or geographies which the Company might be interested in but not captured in the catastrophe model.
- Catastrophe models rely on huge quantities of data of variable quality and so it is vital that the Company, as user of the output, understands the credibility of the data input.
- When using catastrophe models, it is important to understand the assumptions about historical trends embedded in the models and how they have been used to modify historical frequencies.
- The catastrophe model may misestimate the potential for large losses from the portfolio due to unmodelled elements.

[Max 4]
[25 Marks]

Solution 4:

i) Opportunities

- Diversification: The company has traditionally been writing Motor, Crop and Health, so underwriting Fire and Cyber would provide diversification.
- Growth: Entering new lines of businesses can provide growth opportunities both from a topline and bottomline perspective

- Cross Sell: The company will increase their customer base and can cross sell existing products to new customers
- Relationship with reinsurers: The company would need expertise in pricing Fire and Cyber insurance and could reach out to reinsurers for their technical expertise. Hence, relationships with reinsurers would improve and their expertise could be drawn upon
- Will improve the company's competitive position in the market

[Max 2]

Risks

- Lack of knowledge and expertise in designing and pricing these new products
- Could result in unintended exposure to specific perils if the product coverage and policy wordings are not well defined
- Inadequate underwriting expertise in Cyber insurance which could lead to unprofitable risks being underwritten
- Significant potential for large losses from Fire insurance which will have capital implications for the company if suitable reinsurance cover is not purchased
- Exposure to significant claims inflation from Fire insurance stemming from increasing construction costs due to pandemic triggered supply chain constraints
- Cyber insurance being a niche product, there might be limited awareness of the need for the Cyber insurance resulting in lower than expected business volumes.
- May be capital intensive even with diversification
- Might be difficult to find reinsurance coverage at suitable rates
- IT system development to accommodate the new products
- Risks of mis-selling if adequate training is not provided to distribution partners

[Max 4]

[6]

ii) The need for Cyber insurance in India

- In 2019, India was ranked the second largest online market worldwide. Internet traffic has increased significantly since then leaving businesses and consumers vulnerable to a wide range of cyber attacks. This has triggered a growing need for Cyber Insurance
- The pandemic has further accelerated the digital boom and cyber risk increased by as much as 500% since the first lockdown in March 2020
- As per CERT-in, our national cyber security agency, there has been an increase in the number of cyber attacks on personal computer networks given the pandemic triggered shift to working from home for most professionals
- Cyber criminals targeting Covid19 mobile applications with malware thereby stealing individuals personal/financial details
- Increase in Phishing activities
- Fake websites targeting Government agencies
- Number of online banking users almost 150 million +
- E commerce and UPI payments are expected to rise and hence there is a growing need for cyber protection
- The risk is further compounded as awareness and investment in cyber security measures like anti-virus, firewall is limited
- New methods like sim swap, sim cloning are further increasing cyber risk

[Max 5]

<u>Structuring a financially viable Cyber Insurance product</u>

- Adequate measures should be taken to ensure that risk of moral hazard and adverse selection are minimized

- Underwriting guidelines can be structured to ensure that company accept risks which are as per risk acceptance guidelines of company
- Well defined product coverage and benefit limits/sub limits
- Adequate checks at claims stage to avoid fraudulent claims
- Conditions must be added like the need to report a loss within a stipulated time period, requiring evidence that the actual loss has occurred, police report where applicable

- Do's and don't for customers to be accepted for insurance cover. Examples:
  - Install anti-Virus and firewall in mobile devices
  - Install software updates on all mobile devices at regular intervals
  - Use privacy settings on Social media sites to restrict access to personal information
  - Avoid using public wifi

- Various sum insured options and delegated underwriting authority based on sum insured or coverage opted
- Co-payment or deductible should be a part of the product offering
- Reinsurance expertise should be sought in order to price and design the product
- Policy exclusions stemming from Cyber incidents arising from banned website or dark web
- Product may be structured in a way that it can cater to both Retail and Group clients. A master policy might be issued to group policyholders covering all or selected members of that group.
- Pricing should have adequate margins. As the company builds up its own experience, it can move away from reinsurer's rates and use experience rating to price group policies and exposure rating to price retail policies
- Company should hire cyber experts/underwriters/cyber claim specialists as it lacks expertise in cyber insurance underwriting and claims handling.
- Care needs to be taken in structuring the benefit and wordings for ransomware and cyber liability covers as the loss potential is very high under these categories. These benefits should be capped and clearly communicated to customers

[Max 5]

[10]

iii) Points raised by the Chief Underwriting Officer (CUO) are valid and there is risk of accumulation and potential large losses

- Cyber risk in general is exposed to accumulation of risk as a cyber-incident can impact original equipment manufacturers (OEM) like Apple, Samsung etc. or service providers like (Google, Airtel etc.) leaving a large number of customers exposed [1]
- There could be large losses in cyber insurance because of coverages like ransomware, identity theft etc. Also, it could be difficult to prove customer negligence as that would require significant expertise and knowledge which the company currently lacks [0.5]
- Reinsurance can be used to mitigate the risks faced by these events by purchasing excess of loss cover with low retention limits. The company should deal with very highly rated and strong reinsurers. [0.5]
- Risk selection should be very robust and company should employ specialist underwriters [0.5]
- The company should not undercut the market or charge below technical rates, with the aim of increasing volumes but should underwrite for profit [0.5]
- Use excesses/limits to manage accumulations [0.5]
- Important to have clear policy wordings with coverage and exclusions clearly laid out in order to avoid paying claims which were not intended or priced for [0.5]
- Company should endeavour to diversify as much as possible to avoid accumulation of risk. Diversification in

- Geography
- Exposure to service providers
- Types of devices used

[1]

- Underwriting philosophy should be robust and adequate focus should be given to having anti-virus and other cyber protection tools installed on insured devices [1]
- Software should be updated at regular intervals. The company could send mailers or offer incentives like renewal discounts upon installing updated software versions [0.5]
- Technology is changing fast so the product should be agile to changes and should be adaptable to best practices available in the market [0.5]
- To protect against risk accumulation, adverse development cover or stop loss cover can be taken if they are available at a feasible cost. [1]
- Cyber modelling can be done by using data from cat events and applying active exposures in order to understand overall impact. These can be used to formulate sales, underwriting strategy and reinsurance capacity [0.5]
- Limit the income written initially, thereby limiting downside risk [0.5]
- Business interruption cover should be offered to commercial clients only after a comprehensive survey about cyber protection deployed by the client. [0.5]
- Regular reporting of data from this product so any signs of deterioration can be identified early and necessary corrective actions can be put in place [0.5]

[Max 10]

[26 Marks]

****