

INSTITUTE OF ACTUARIES OF INDIA

CB3- Business Management

November 2025 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.

MCQs- (2 marks each)

Q No	Correct Answer
Q1	C
Q2	C
Q3	C
Q4	A
Q5	D
Q6	D
Q7	D
Q8	A
Q9	B
Q10	D
Q11	C
Q12	C
Q13	B
Q14	C
Q15	E

Solution 16:**Case Study 1: Designing Inclusive Insurance Products for Vulnerable Communities****a) Product Design Considerations****i) Key Actuarial Considerations (2)**

1. **Affordability vs. Solvency:** Premiums must be low enough for low-income households but sufficient to cover expected claims and administrative costs. Actuaries must model loss ratios carefully.
2. **Policyholder Demographics & Mortality/Morbidity Assumptions:** Adjust assumptions to reflect the specific risk profile of low-income groups, which may differ from general population (e.g., higher risk exposure, lower access to healthcare).

ii) Challenges in Setting Premiums (3)

- Limited historical data on claims experience for low-income segments.
- Need to balance government subsidies with actuarial soundness.
- Pricing must account for behavioral factors like irregular premium payments or partial coverage uptake.

iii) Consideration for key stakeholders (5)

When designing a **micro-insurance product**, the actuary must consider the needs of all key stakeholders to ensure affordability, sustainability, and fairness.

For **policyholders**, the actuary should design simple, low-cost products that meet essential protection needs and suit the income pattern of low-income groups.

For the **insurer**, the product must be financially viable and operationally efficient, ensuring sound pricing, cost control, and scalability despite low premiums.

As the **government is subsidizing the premium**, the actuary should ensure the subsidy is well-targeted and transparent, promoting inclusion without dependency, while complying with all regulatory and solvency requirements.

For **distributors**, such as agents or NGOs, the actuary should design products that are easy to administer, with fair incentives that encourage ethical selling and efficient claims handling.

For **society and NGOs**, the product should promote financial inclusion and social welfare by reducing vulnerability to unexpected risks.

Finally, the actuary should work with **reinsurers** to arrange suitable reinsurance cover, protecting the insurer against excessive or catastrophic losses.

b) Risk Management Strategies

i) Risk Mitigation Strategies (5)

1. Reinsurance/Pooling: Transfer part of the catastrophic risk to reinsurers or pool risks across regions to stabilize claims experience.
2. Product Design Controls: Introduce coverage limits, waiting periods, or simplified underwriting to limit adverse selection and extreme claims.

ii) Impact of Adverse Selection and Moral Hazard (5)

- Adverse Selection: High-risk individuals are more likely to enroll, increasing claims cost. Mitigation: require minimal health checks or enrollment through community organizations.
- Moral Hazard: Policyholders may over-utilize services knowing they are insured. Mitigation: co-payments, claim limits, or incentivizing preventive behavior.

c) Financial Projections

i) Implications for Pricing and Sustainability (5)

- If claims experience exceeds projections, premiums may need adjustment or subsidies increased.
- Experience monitoring is crucial; pricing must incorporate a margin for adverse deviations.
- Sustainability depends on balancing affordability with adequate reserves.

(25 marks)

Solution 17: Case Study 2: Regulatory and Ethical Challenges in Health Insurance**a) Regulatory Compliance****i) Key Requirements (2)**

1. Product Approval: New policies must be filed with and approved by IRDAI before launch.
2. Solvency & Reserving: Ensure premiums and reserves meet IRDAI solvency norms to protect policyholders.

ii) IRDAI Role (3)

- Oversight of product design, pricing, and solvency.
- Enforces disclosure and reporting standards to safeguard policyholders.
- Market Development and Inclusion by encouraging innovation, standardization of products etc.

b) Ethical Considerations**i) Ethical Implications (5)**

- Selling inadequate coverage can mislead policyholders and harm public trust.
- Actuaries must ensure transparency and highlight coverage limitations.

ii) Actuary Responsibilities (5)

- Provide independent, objective advice on product risk and pricing.
- Ensure communication to management and stakeholders is clear about risks.

c) Pricing and Sustainability**i) Pricing Model (2)**

- Use expected claims cost + administrative expenses + margin for uncertainty.
- Incorporate morbidity tables, lapse assumptions, and potential adverse selection effects.

ii) Contribution to Sustainability (3)

- Adequate pricing prevents future losses.
- Monitoring actual vs. expected claims allows adjustment of premiums and underwriting.
- Supports long-term product viability while remaining affordable.

(20 marks)

Solution 18: Case Study 3: Climate Change and Its Impact on Agricultural Insurance**a) Actuarial Modeling Techniques****i) Concept & Differences (5)**

- Weather index insurance pays out based on measurable weather indices (rainfall, temperature) rather than actual crop losses.
- Differs from traditional crop insurance, which indemnifies actual losses and requires field assessment.

ii) Modeling Techniques (5)

- Historical weather data analysis and statistical modeling (e.g., extreme value distributions).
- Correlation with crop yields to set trigger thresholds.
- Stochastic simulations to estimate expected losses and pricing.

b) Data Requirements and Challenges**i) Key Data Inputs (5)**

- Historical weather data (rainfall, temperature, humidity).
- Crop type and sowing patterns.
- Yield sensitivity to weather indices.

ii) Challenges (5)

- Sparse or inconsistent weather station coverage in rural areas.
- Data quality issues, missing records, or outdated systems.
- Localized microclimates may not align with index measurement points.

c) Policyholder Engagement and Adoption**i) Strategies for Awareness (2)**

- Collaborate with agricultural extension services and cooperatives.
- Conduct local workshops and information campaigns.
- Use mobile apps and SMS notifications for education and claims updates.

ii) Role of Community Organizations (3)

- Act as intermediaries to explain product benefits and limitations.
- Help with enrollment and claims verification.

- Build trust, improving adoption rates and reducing moral hazard.

(25 marks)
