



Subject: AP2

Chapter: Unit-1

Category: Practice Questions

Q1. CP1 – April 2020 – Paper 1 – Q2

Outline why regular risk reporting is important for the management of a financial institution. [4]

Q2. CP1 – April 2020 – Paper 1 – Q3

(i) Define the following terms:

(a) systematic risk

(b) diversifiable risk. [2]

(ii) Describe why a manufacturing company may decide to offer only a single product, rather than a diversified product range. [6]

[Total 8]

Q3. CP1 – April 2020 – Paper 1 – Q8

A wealthy individual has a large cash lump sum. He has asked an actuary to advise on how he might invest this sum to provide for himself and his family in retirement, and to be able to leave an amount as an inheritance.

- (i) Describe how the actuary would assess the individual's future liabilities. [4]
- (ii) Identify four key risks, from the viewpoint of the individual, which the actuary should consider when giving their advice. [2]
- (iii) Describe how each of the risks in (ii) might be mitigated. [6]

[Total 12]

Q4. CP1 – April 2020 – Paper 1 – Q9

A bank sells a special mortgage product to prospective borrowers aged over 70. The product provides a loan secured on the accumulated equity in the borrower's home.

The borrower does not need to make any cash payments to the bank on the amount borrowed. Interest is added to the loan balance every month; a fixed, non-reviewable rate of interest is charged. The loan balance (including accumulated interest) has to be repaid when the borrower dies, moves into long-term care or sells the property.

- (i) Describe the risks the bank is exposed to with this product. [6]
- (ii) Propose, with reasons, actions the bank could take to manage the risks identified in (i). [8]

[Total 14]

Q5. CP1 – September 2020 – Paper 1 – Q4

- (i) Describe the four steps necessary to achieve an effective identification and analysis of the risks facing a project. [4]

A savings product pays out a guaranteed lump sum to the beneficiary 2 years after purchase, in return for an initial single premium.

- (ii) List the reasons the company may not pay in full. [2]
- (iii) Outline the risks the beneficiary may face if the payment amount is not guaranteed. [2]

[Total 8]

Q6. CP1 – September 2020 – Paper 1 – Q5

An insurance company writes marine insurance to protect shipping from losses in relation to acts of violence such as war or piracy. Due to increasing political tensions, such actions are becoming more common in one area of the world in which the company has a number of clients.

- (i) Describe, with specific examples, how the company can use risk control measures to mitigate exposure to the risks arising from these political tensions. [4]
- (ii) Discuss how the company can use scenario analysis to predict and control future exposure to such risks. [4]

[Total 8]

Q7. CP1 – September 2020 – Paper 1 – Q9

A number of countries are members of a union where member countries can access each other's markets. In return, member countries follow a consistent set of regulations governing, among other things, financial services.

Country F, a developed country that has been a member of the union for many years, has recently decided to leave the union. The government of Country F is proposing a full review of its regulations, including for financial services.

- (i) Outline the principal aims of regulation of financial markets. [2]
- (ii) Describe possible regulatory regimes the government of Country F could consider implementing. [3]
- (iii) Suggest an advantage and a disadvantage of each of the regimes identified in part (ii). [3]
- (iv) Outline the potential risks to the domestic financial services industry that Country F faces as a result of changing its regulatory regime now. [4]
- (v) Discuss why the countries remaining in the Union might be concerned about any changes to Country F's regulatory regime. [4]
- (vi) Suggest how the countries in the Union might seek to mitigate any risks in relation to (iv) and (v). [4]

[Total 20]

Q8. CP1 – April 2021 – Paper 2 – Q2

Background

The government maintains and operates the railway system for the whole of a developed country. The government is responsible for ensuring that trains run on time and ticket prices provide customers with value for money. The train system is critical for most customers who commute to work in the main cities in the country.

The government has the following policies for refunding customers if a train journey is delayed or cancelled:

15–29 minutes late = 20% of the customer's ticket price refunded

30–59 minutes late = 40% of the customer's ticket price refunded

60+ minutes late or train cancelled = 100% of the customer's ticket price refunded.

The government also maintains the roads in the country and has introduced a new traffic charge for the country's six largest cities. The traffic charge is applied to vehicles entering or moving within each city traffic charging zone between 8 am and 10 am and between 4 pm and 7 pm on weekdays (excluding national holidays). The traffic charge is inflation-linked increasing each year. The

government expects to keep the traffic charge and inflation-link policy in place for at least the next 10 years.

The introduction of the new traffic charge has not been popular with citizens. Due to the poor punctuality of the train service, the introduction of the traffic charge has had a minimal impact on the number of vehicles entering the six largest cities.

The government is planning to outsource the maintenance of the railways to an overseas company, with the expectation that this will significantly improve the reliability and punctuality of trains. In addition, the government is evaluating the following package of proposals:

Action 1 To insure the risk of the train services being delayed/cancelled: in return for a premium, an insurance company would pay the necessary refunds on tickets.

Action 2 To sell the future rights to the traffic charge income to a pension scheme: in return for a one-off payment, the pension scheme would receive all future income from the traffic charge. The government is willing to split the rights into individual cities if more than one pension scheme is willing to invest. The rights would be sold using a bidding system to maximise the price.

Questions

- (i) Outline the risks of Action 1 from an insurance company's viewpoint. [5]
- (ii) Discuss the data an insurance company would need in order to price the contract under Action 1, including commenting on the limitations of the data. [10]
- (iii) Discuss the factors an insurance company would need to consider (other than the availability of data) when pricing the policy in Action 1. [12]
- (iv) Describe the risk management tools available to an insurance company should it offer a contract under Action 1. [7]
- (v) Outline the reasons a pension scheme may want to invest in the roads where the new traffic charge will apply. [5]
- (vi) Outline the advantages and disadvantages of using a discounted cashflow method to value the future traffic charge rights. [2]
- (vii) Discuss the issues that the pension scheme will need to consider in determining the cashflows to value the future traffic charge rights under Action 2. [6]
- (viii) Discuss the risks the pension scheme should consider before submitting a bid under Action 2. [8]

- (ix) Suggest how the government could evaluate whether the package of proposals is a success. [3]

[Total 58]

Q9. CP1 – April 2021 – Paper 1 – Q5

A pension scheme uses an algorithmic trading system for its investment in domestic equities.

- (i) Outline the potential risks associated with algorithmic trading for this pension scheme. [3]
- (ii) Discuss the professional and technical standards that may apply to actuaries giving advice to a pension scheme. [6]

[Total 9]

Q10. CP1 – April 2021 – Paper 1 – Q6

A global insurance group has 20 different business units around the world, split as follows:

ten life insurance companies selling term assurance and annuity products

ten general insurance companies specialising in unique risks (e.g. insuring the President of the United States of America's air travel).

- (i) Discuss how enterprise risk management could be used to decide how capital could be distributed between the group's business units. [5]

One of the general insurance companies (Company X) in the group has been invited to quote for insuring the risk that the next four Olympic Games, which happen every 4 years, are delayed or cancelled.

- (ii) Outline how Company X would prioritise this opportunity relative to the other business units' business plans. [5]

[Total 10]

Q11. CP1 – September 2021 – Paper 1 – Q1

Two people, both aged 30, are planning to retire at age 65. Person A is a member of a defined benefit scheme and Person B is a member of a defined contribution

scheme. They have both received statements from their respective scheme provider, which show the same projected pension benefits at age 65.

Compare the risks affecting the retirement benefits that Person A and Person B will receive. [5]

Q12. CP1 – September 2021 – Paper 1 – Q7

An investment management firm is launching a new range of funds to be marketed as ethical investment funds.

- (i) Outline possible ethical criteria that the new range of funds will need to meet. [3] One of the firm's directors has expressed a concern that ethical investment funds will always produce lower returns than investment funds without these restrictions. Therefore, the lower performance of the ethical investment funds risks damaging the firm's brand.
- (ii) Discuss whether ethical investment funds have lower expected returns than investment funds without these restrictions. [4]
- (iii) Propose how the firm could mitigate risks to its brand and profitability. [5]

[Total 12]

Q13. CP1 – September 2021 – Paper 1 – Q11

An insurance company has decided to replace its existing deterministic pricing, valuation and financial planning models with stochastic models.

- (i) Discuss why an insurance company may decide to use a stochastic model. [3]

The insurance company has purchased a commercially available pricing model and used the model to reprice its products. Following the repricing, sales volumes increased. Results now show that the repriced business is making a loss.

- (ii) Suggest reasons why using the new pricing model may have resulted in a loss on this business. [7]
- (iii) Discuss how different stakeholders could be affected by the company making losses. [5]

[Total 15]

Q14. CP1 – April 2022 – Paper 1 – Q8

Insurance companies in a particular country used to offer products that covered the costs of nursing-home care for elderly people. The number of elderly people in nursing homes has increased but these products are no longer offered.

- (i) Suggest possible reasons why these products are no longer offered. [5]
- (ii) Propose other ways an individual could fund their future nursing-home care needs. [3]
- (iii) Describe the risks the individual will face for each of the proposals in part (ii). [6]

[Total 14]

Q15. CP1 – April 2022 – Paper 1 – Q9

A credit union is a non-profit financial organisation that is set up and owned by its members who share a common membership characteristic – for example, members who live in the same location or who work in the same profession.

The members of credit union GG all live in a particular city. GG offers savings and loans to its members.

- (i) Explain how the principle of pooling risks will apply to the loans GG offers. [3]
- (ii) Describe how the methods of risk acceptance, rejection, transfer and management can be used by GG to manage the loans it offers. [5]

Due to exceptional circumstances affecting some of its members, GG has decided to allow all members access to a loan of up to £500. Loans will be automatically granted to all members who apply within a fixed time period.

- (iii) Suggest reasons why GG might have decided to offer these exceptional loans. [4]
- (iv) Explain potential problems GG may have, relating to these exceptional loans. [2]
- (v) Discuss how the problems identified in part (iv) could be mitigated. [3]
- (vi) Discuss how your answer to part (iv) may differ if GG was formed of members with a common profession, rather than of members who live in the same city. [4]

[Total 21]

Q16. CP1 – April 2022 – Paper 2 – Q1**Background**

TT Insurance is an insurance company, owned and established by four individuals, and based solely in Country A. TT Insurance specialises in travel insurance and sells no other types of insurance. TT Insurance heavily markets its products via social media. TT Insurance currently only sells a simple travel insurance product. TT Insurance's marketing strategy focuses on the simple product and it aims to make it as easy as possible for customers to buy this product.

TT's travel insurance product only provides the following cover:

medical expenses if the policyholder becomes ill when abroad

repatriation expenses for medical reasons.

TT's travel insurance is only available to customers aged under 65, with no pre-existing medical conditions.

The government of Country A is planning to introduce legislation making it illegal to ask potential customers for information relating to pre-existing medical conditions when applying for insurance products. Certain strictly defined forms of insurance will be exempt but travel insurance is not expected to be among them.

There are no regulations or legislation relating to Environmental, Social and Governance (ESG) considerations in Country A. However, investors in Country A generally expect well-run companies to have high ESG standards and practices in place. The government of Country A is considering introducing regulation to make ESG reporting a requirement for all companies, with the possibility of stronger requirements in future if considered necessary.

Questions

- (i) Discuss why TT may have decided to only offer this single product. [10]
- (ii) Discuss how the change in legislation limiting the questions that may be asked will affect TT's business. [8]
- (iii) Suggest the data issues that may arise for TT as a result of this change in legislation. [6]
- (iv) Describe two low-likelihood high-impact risks for TT's travel insurance. [4]
- (v) Discuss how the risks outlined in part (iv) could be managed or mitigated. [5]

- (vi) Describe how ESG considerations could impact insurance companies. [7]
- (vii) Suggest how any changes to ESG regulation could impact TT's business. [5]

- (viii) Suggest how TT could raise additional capital if needed. [5]

[Total 50]

Q17. CP1 – September 2022 – Paper 1 – Q2

The regulation of defined benefit schemes in a country requires that the assumptions used to determine the scheme's provisions for liabilities are the actuary's best estimate of future experience plus a margin for prudence.

Outline how sensitivity analysis can be used to determine the appropriate margin for prudence. [4]

Q18. CP1 – September 2022 – Paper 1 – Q4

An investment management company only invests in domestic equities and has a target to outperform the return on the main domestic equity index over a rolling 3-year period.

- (i) Discuss how the systematic and diversifiable risks associated with the fund can be mitigated. [3]
- (ii) Describe the roles and responsibilities of various stakeholders in the risk management process at the investment management company. [3]

[Total 6]

Q19. CP1 – September 2022 – Paper 1 – Q6

An insurance company uses financial derivatives to manage its exposure to options and guarantees across a range of financial products it has sold to investors. The range of financial products includes ones that pay benefits on death, on surrender and on maturity.

- (i) Outline the options and guarantees that the insurance company could offer at death, surrender and maturity. [3]
- (ii) Explain why the insurance company may use financial derivatives to manage risk in these products. [4]

[Total 7]

Q20. CP1 – September 2022 – Paper 1 – Q7

A manufacturing company is carrying out a review of all of its global operations to try to understand where it is most exposed to financial, operational, economic and other risks.

- (i) Explain with examples how scenario analysis may be used to assist in this review. [5]
- (ii) Explain why stress testing may be preferable to scenario testing in some situations. [3]

[Total 8]

Q21. CP1 – September 2022 – Paper 1 – Q8

- (i) Explain how the principles of pooling risk are applied in the business of motor insurance. [4]

A company selling motor insurance has recently moved into insuring very high-value cars. They have noticed that this book of business has been less profitable than their standard business.

- (ii) Suggest reasons why this book of business may be less profitable. [2]
- (iii) Outline how the company may make changes to increase the profitability of this book of business. [3]

[Total 9]

Q22. CP1 – September 2022 – Paper 1 – Q11

A company is planning to introduce e-scooters (a two-wheeled vehicle powered by batteries) for short-term rental in a large city.

- (i) Outline the risks that the company will need to consider before going ahead with this project. [5]

The company has investigated options to mitigate the risks it faces from renting e-scooters. They have decided that insurance will be needed to cover the risks from part (i). An insurance company has been asked to quote for this business.

- (ii) Discuss the factors the insurance company will need to consider when pricing this business. [6]
- (iii) Outline other possible actions the company providing e-scooters may consider in order to manage the risks before going ahead with the project. [3]

[Total 14]

Q23. CP1 – September 2022 – Paper 1 – Q12

A regulator is reviewing a life insurance company's financial resilience using stress and scenario testing that considers a 5-year time horizon.

- (i) Explain why the regulator has chosen a 5-year time horizon. [3]
- (ii) Suggest, with reasons, the risks that could be included. [3]
- (iii) Suggest the financial measures that could be included in the review. [3]

The regulator has proposed an approach with four distinct time stages.

Stage 1	Stage 2	Stage 3	Stage 4
Balance sheet and capital requirements calculated immediately following stresses to: interest rates. credit spreads (no credit rating downgrades). equity prices.	Balance sheet and capital requirements calculated immediately following stresses to: interest rates. credit spreads. credit rating downgrades. equity prices. property prices.	Same stresses as Stage 2. Balance sheet and capital requirements calculated after changing the asset mix.	Same stresses as Stage 2 plus stress to longevity and lapse assumptions. Balance sheet and capital requirements calculated after changing the asset mix.

- (iv) Assess the regulator's proposal for testing the company's financial resilience including its reasoning for including each stage. [5]

[Total 14]

Q24. CP1 – September 2022 – Paper 2 – Q2

A private company has been awarded a contract by the government of a developed country (Country Y) to build and operate Country Y's first national aquarium ('the aquarium').

The aims of the aquarium are to:

gain an international reputation.

be a tourist attraction.

breed, and subsequently release back into the wild, rare and endangered fish.

Based on its intention to honour all of the aims, the company has just been granted permission by the government of Country Y to be the sole provider of the aquarium.

The company has asked an Actuary for advice on certain aspects of this project.

In particular, the company would like advice on how to achieve the aims of the aquarium while maximising its return on capital.

The company first needs to decide on a location for building the aquarium. It will then put in place a team to take responsibility for the construction and subsequent day-to-day running of the aquarium. The company still needs to decide on the precise mix of activities to be undertaken by the aquarium, once opened.

- (i) Outline the issues to be considered in choosing a suitable location for the aquarium. [6]
- (ii) Suggest possible types of insurance that the aquarium may require. [3]

Assume that the company has now purchased the land on which they will be able to build the aquarium. The company is now seeking advice on the financial impact of the possible activities to be undertaken by the aquarium, once opened.

- (iii) Suggest the main activities that the aquarium could choose to undertake, and the cashflows that would be associated with each activity. [6]
- (iv) Outline the risks that the private company will have in building the aquarium and then subsequently the activities mentioned in part (iii). [5]
- (v) Suggest possible actions that the aquarium could take to mitigate the risks mentioned in part (iv). [5]
- (vi) Describe the modelling that could be undertaken to decide on the optimum mix of possible activities. [6]
- (vii) Discuss how the aquarium could be funded, both for the building of the aquarium but also the ongoing running of the activities set out in part (iii). [6]

- (viii) Discuss, from the point of view of the company, possible methods it could use to remunerate the Actuary for the advice. [3]

[Total 40]

Q25. CP1 – April 2023 – Paper 1 – Q7

- (i) Propose, with reasons, three risks that a defined benefit scheme may wish to hedge. [3]
- (ii) Explain why a defined benefit scheme may choose to use liability hedging. [2]
- (iii) Discuss the risks that may still exist for a defined benefit scheme even if it has hedged its liabilities. [5]

[Total 10]

Q26. CP1 – April 2023 – Paper 2 – Q1

A country with a population of 50 million people has a small town with 50,000 inhabitants located on an island situated a short distance from the mainland. The only connection that the island has to the mainland is one bridge that is now over 50 years old. The road that connects the town on the island to the mainland passes mainly through an important habitat for birds that has been subject to increasing environmental protections over the last 50 years.

The local government for the town recognises that the road and bridge are a critical link between the island and mainland. The maintenance of both the road and bridge is a priority for the local government; however, the connection to the mainland must always be operational. Maintenance of the bridge is typically planned at least 2 years in advance considering the age of the bridge, operational requirements and the local government's financial resource constraints. Occasionally, there will be a need to carry out emergency maintenance on the bridge.

Until 10 years ago, coastal sea flooding of the road from the town to the mainland was very rare. However, in the last 10 years, the frequency and severity of storms that cause flooding and other damage to the road have increased. On one recent occasion, a severe storm and associated coastal flooding caused damage to both the road and bridge, making them unavailable for a week.

The local government has proposed to engage an actuary to undertake a review of its transportation road and bridge link with the mainland. The review will consider the island's infrastructure requirements and assessment of risks for its link with the mainland for the next 50 years, including considering climate change risk.

Currently the local government pays for maintenance costs of the road and bridge link as they arise. A suggestion has been made that a 20-year fixed-cost

maintenance contract could be set up to manage the risks and cost of maintaining the road and bridge.

- (i) List the stakeholders who will be part of the transportation review. [6]
- (ii) Describe three potential conflicts of interest that could arise between the stakeholders identified in part (i). [3]
- (iii) Set out the factors, including any further investigations, an actuary would need to consider before agreeing to undertake this review. [7]
- (iv) Describe the possible risks that the actuary should consider in their review. [9]
- (v) Suggest four possible actions to mitigate the risks identified in part (iv). [4]
- (vi) Discuss the possible issues with using a model that assesses the impact of climate change in the review. [5]
- (vii) Assess the suitability of a 20-year fixed-cost maintenance contract for the road and bridge link. [11]
- (viii) Discuss other possible ways that the government could fund the maintenance contract. [5]

[Total 50]