

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

April 2012 Examinations

**Subject CA1 – Actuarial Risk Management**

### **Paper One**

#### **Purpose of Examiners' Reports**

The Examiners' Report is written by the Principal Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and who are using past papers as a revision aid, and also those who have previously failed the subject. The Examiners are charged by Council with examining the published syllabus. Although Examiners have access to the Core Reading, which is designed to interpret the syllabus, the Examiners are not required to examine the content of Core Reading. Notwithstanding that, the questions set, and the following comments, will generally be based on Core Reading.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report. Other valid approaches are always given appropriate credit; where there is a commonly used alternative approach, this is also noted in the report. For essay-style questions, and particularly the open-ended questions in the later subjects, this report contains all the points for which the Examiners awarded marks. This is much more than a model solution – it would be impossible to write down all the points in the report in the time allowed for the question.

T J Birse  
Chairman of the Board of Examiners

July 2012

## **General comments on Subject CA1**

This subject examines applications in practical situation of the core actuarial techniques and concepts. To perform well in this subject requires good general business awareness and the ability to use common sense in the situations posed, as much as learning the content of the core reading. The candidates who perform best learn, understand and apply the principles rather than memorising the core reading.

The examiners set questions that look for candidates to apply the principles specific to the situation set out in the questions, having read the question carefully. Many candidates gain few marks by writing around the subject matter of the question in a more general fashion. Detailed specialist knowledge is not required and nor is very detailed development of particular points.

Good candidates demonstrate that they have used the planning time well – an attempt to understand the breadth of the answer required combined with a logical flow is a big advantage in making points clearly and without repetition. This also enables candidates to use the later parts of questions to generate ideas for answers to the earlier parts. Time management is important so that candidates give answers to all questions that are roughly proportionate to the number of marks available.

## **Comments on the April 2012 paper**

The general performance was slightly better than in April and September 2011. Questions that required the application of principles or explanation, such as Q4 and Q5, were less well answered. The comments that follow the questions concentrate on areas where candidates could have improved their performance. Candidates approaching the subject for the first time are advised to use these points to aid their revision.

- 1** Life insurance costs rise as individuals get older. This is because mortality rates increase at older ages. As a result, the cost for the renewable term will be higher than the initial term.

There is also a value to providing an option which will increase the price of the special policy.

One option would be to have a higher premium on the initial term of the special policy. This higher price would reflect the value of the option and uncertainty in pricing after five years.

Under this options the renewal term could be priced at the standard rate for an individual five years older. Another option would be for the initial term to have the same price as the standard policy. If this option is taken the renewable term would have a higher price than the initial term to allow for the increased cost at older ages.

A further increase may be required to allow for potential changes in market conditions during the next five years. As the price is agreed in advance the insurer will not be able to change the price if conditions are worse after five years. However, if conditions have improved the policyholder could simply let the policy lapse and buy a new policy.

There may be a cost saving on renewal if administration costs are lower on renewing compared to starting a new policy.

If the same price is used for both policies for the initial term then the insurer is effectively providing a guarantee at no additional cost. Potential policyholders should always choose this policy as they gain an additional option and give up nothing in return. It may mean the first policy becomes irrelevant in the market. Therefore the initial premium for the special policy is most likely to be higher than the premium for the standard policy.

The insurer could decide that it would like the renewable term to be priced at the same premium as the initial five year term. If this will be the case then the initial term will need to have a higher premium than the first policy.

This would make the policy less attractive initially than the first policy. Although it may make it more likely that the policyholders will renew at the end of the term – as they will have already paid up front for the option.

*Disappointedly poorly answered. Many candidates failed to appreciate that providing an option has a cost and introduces additional uncertainty into the outcome. A number of candidates did not focus on how the mortality experience and health of the policyholder could change and affect whether the option is exercised.*

- 2** (i) Investment strategy should be reviewed regularly as part of the pension scheme’s governance process.

The strategy may be reviewed in light of recent asset performance, or performance of particular fund managers. For example, following strong asset performance the pension scheme may wish to move into less risky asset classes to reduce the volatility of returns, locking into the current funding position.

If there have been problems with the performance of a particular manager and they wish to remove him, the pension scheme may wish to carry out a broader review of investment strategy. This could be to avoid the possibility of a future review requiring dis-investment of funds; hence ensuring only one set of transaction costs will be necessary.

Changes to the liability structure will lead to a review of investment strategy. This is because the assets should reflect the nature of the liabilities, considering term and whether fixed or inflation linked. For example, there may have been a large number of retirements or withdrawals from active service.

Bulk transfers into or out of the pension scheme could also change the liability structure.

The sponsor’s attitude to investment risk may have changed.

There may be new asset classes available, or legislation may have changed making more asset classes permissible.

- (ii) (a) The active fund has underperformed the benchmark in two of the three years. The most significant underperformance was in year two, where the benchmark was missed by 5%.

The passive fund has matched the benchmark over three years, underperforming once and outperforming once – both times by 1%. The active fund has achieved higher returns than the passive fund in each year. However, as the benchmark for the active fund is higher its performance is more disappointing than that achieved by the passive fund.

- (b) Performance will have been impacted by market conditions over the three year period, although this will also be reflected by the benchmark return.

Timing of cashflows will also impact on the return that has been achieved, for example if losses were made when making a forced disinvestment. Overall performance measurement (if looking at a money weighted return) will be impacted by the size of invested funds in each year.

Differences between the active fund and benchmark could be due to poor stock or sector selection.

Differences between the passive fund and benchmark could be due to tracking errors caused by not investing exactly in line with the benchmark portfolio.

Inconsistencies in the benchmark, for example a change in underlying constituents or lag in collection and publication of data could lead to the portfolio not tracking the benchmark.

- (iii) Size of charges or other deductions regularly made from assets.

Size of withdrawal penalties, or any other conditions which limit access to investments.

Whether investments have been made in line with stated objectives.

Any changes to the stated investment objectives since the last review.

Quality of operational procedures and audit process.

Qualification of investment personnel and training / development plans in place to maintain level of proficiency.

Changes to key personnel since the last review. For example loss of lead investment manager.

Quality of communication, including responsiveness to instructions and accuracy / timing of investment statistics.

Any good or bad publicity surrounding the investment managers, possibly including loss of large / key investors in the fund.

*Generally well answered. However, many candidates covered issues relating to review of performance rather than strategy in part (i). The purpose of part (iii) was to provide a balance that a pension scheme would consider other aspects than just the performance in selecting an investment manager, however, candidates identified fewer of these points.*

- 3** (i) Character and ability of the borrower. Knowledge of the borrower, its principles and ability to repay any loan will be the main driver behind any credit rating.

Purpose of the loan. A loan taken to fund investment in infrastructure will be seen more favourably than a loan to cover cashflow difficulties.

Amount of the loan. The size of the loan in particular compared to the stated purpose and significance relative to the size of the lender will affect the perceived credit risk.

Repayment of the loan. How certain is the source of repayment and what safety margin is built into projections and assumptions. Does the borrower have free cashflow to cover loan repayments?

Past practice. If the borrower has defaulted on a payment the credit rating will be lower.

Other counterparties. The borrower may be exposed to other creditors (customers with outstanding credit, or companies with outstanding tax bills). The quality of these other creditors will impact on projected cashflow and security.

The size of existing bonds relative to the size of the issuer will impact on the security of any new issue. If any existing bonds have higher priority, for example if they are secured on specific assets, then this will decrease the security of any subsequent bond issue.

Exposure to other risks. Exposure to market, currency and operational risks will affect the security of any loan as these will influence the range of scenarios under which the loan can, or cannot, be repaid.

Future developments. There may be other events in the future which could impact on the borrower. For example fears of an economic downturn may spark concerns on the security of government debt.

- (ii) Higher yields are generally a reward for taking on more risk.

As a small firm, there will be less security available in respect of company assets; the net cashflow may be more volatile. These factors could increase risk.

Government bonds are also typically seen as lower risk due to the ability to change taxation to meet obligations, or to print money if required.

A large multi-national firm will be exposed to a number of different economies. This diversification means changes to the local economy will be less significant to the company and may reduce market risk.

The credit rating of the firm may be poor. Firms with a poor credit rating typically have to offer higher yields. Other market data may also suggest potential problems with repaying any bond.

Yields are also a product of supply and demand. There may be less demand for investments in a small firm; lower demand will mean a higher yield needs to be provided.

Marketability of bond. A small firm is likely to require a smaller issue of bonds. This may reduce the marketability of the bond issue and hence may result in a higher yield being required.

- (iii) Security offered under each bond e.g. charges on assets.

Size of the bond issue and term of the bonds, which will affect marketability.

Options or guarantees available on a particular bond.

The investor will want to consider the investment in the context of the current portfolio. For example whether there is already exposure to the counterparties / industries involved, or whether this offers a chance to diversify.

The investor's liabilities and size of any free assets will also impact on any decision.

The investors risk appetite will determine the amount of credit risk she is willing to take on.

Special tax treatment or regulatory restrictions which may apply to different bonds.

Current fashion or trends for individual investment.

*Generally well answered. The marks for part (i) were generally lower due to narrow answers being given. A consideration of the influence the characteristics of the bonds set out in the preamble to part (ii) would have on their credit rating could have improved the breadth of answers to part (i). In parts (ii) and (iii) most candidates scored close to the marks available.*

- 4** (i) More complex models are now being used because the ability to construct and run such models has increased.

Increased computing resources in terms of power/capacity and an ability to handle complex calculations is the main factor.

Such resources are now relatively cheap to access.

In particular, there are now more trained people capable of performing the tasks required to set up and maintain these models.

More complex models allow companies to innovate and offer refined products, which could give them a competitive advantage.

In particular products may be made more attractive through the use of options and guarantees, which require complex models.

Asset classes such as derivatives have become more developed, this means more complex models are required to analyse investment potential.

Companies are more aware of the benefits these assets can provide and so models have been developed to help companies understand investment return and associated risks.

A greater emphasis on risk monitoring and control has increased the use of derivatives requiring more complex modelling.

It could be argued that, in a more globalised environment, even relatively simple products are subject to many influences and therefore complex models are required to assess simpler products and their associated risks.

Regulators may stipulate modelling requirements for reporting purposes, and hence complex models may be effectively required by regulation.

- (ii) The directors are unlikely to be experts either on the particular product being developed or on technical modelling.

Hence they may find it very difficult to interpret or understand the model and its output themselves.

They will have to rely on the advice of others who are experts in those areas.

These experts will have a vested interest in the use of the model (bonuses etc.) and so may be incentivised to underplay any risks.

Full appreciation of modelling results may require a lot of output, which makes understanding difficult, and can lead to summary statistics being used.

This means the directors must rely on the summary produced and communicated by the development team. Use of jargon and misleading or incomplete summaries may mean that understanding is limited.

Given the detail and complexity, there is a further risk that directors may be forced to assume that the model is right. This may arise if they are unable to challenge the method or assumptions proposed (i.e. are blinded by science and presentation).

There will be many assumptions underlying a complex model, and these assumptions may also have a number of associated correlations.

It may be therefore be difficult to appreciate the significance of particular assumptions. The directors will need to consider which assumptions are most important and how best to appreciate these.

To understand the risks the directors will need to consider the sensitivity of results to changes in assumptions, and how assumptions have been derived.

Subjective assertions regarding the efficiency of markets or investment assumptions relying on rational investor behaviour may be difficult to estimate reliably.

Some assumptions may be hard to model or require the use of probability distributions. These assumptions will be particularly difficult to communicate to directors.



The use of distribution functions can mean that low likelihood but high impact risks are not fully appreciated. This is especially relevant for the insurance policy as the aim is for no risk hence big shocks could be very significant.

Shocks may be particularly difficult to model if the policy relies on hedging or geared investments. Small errors in the assumptions or their correlations for geared investments could have a significant impact on results.

- (iii) Assumptions on money market interest rates will be needed. If these assumptions are significantly wrong or if markets become illiquid hedging won't work and huge risks could arise.

If there are complicated investments within the product which cannot be hedged these will also need to be modelled directly.

Default and counter-party risks could be significant and they are hard to hedge.

Currency exposure will also be difficult to model and require consideration of a number of external economic factors.

It may be very difficult to see if and how the overall hedge is made up and fully appreciate the real net exposure.

Approximate hedging may be required based on indices or a notional portfolio. The impact of differences between the actual portfolio and any approximation will be difficult to understand.

The level of protection may be ambiguous. That is, the institution may not be certain as to what it is actually insuring. For example, will the loss be solely related to the price of the product or its use in combination with other assets – the exact nature of the product must be considered.

*This was the least well answered question on the paper. Many candidates did not reflect on the practical issues involved in parts (ii) and (iii). Part (ii) and (iii) were testing candidates' appreciation of the limitation of financial models. Financial models incorporate simplifications and either implicit or explicit assumptions and it is important that the user of the results from models understands the limitations that arise from this.*

- 5** (i) Starting point will be the existing racehorse population. Considering the development in the population the key assumptions will be:
- How many horses will still be in training at age thirteen.
  - This will depend on expected rates of death and retirement at each age up to age ten.

- The rate of “ill-health retirement” certified by registered vets would also be required. This assumption would be less significant if horses which retired early due to injury had benefits reduced on a cost neutral basis.
- If benefits are not increased on a cost-neutral basis if horses race beyond age ten an assumption on late retirement rates may also be needed.
- How long horses are expected to live after age thirteen.

The assumptions will need to be broken down into homogenous groups of race horses, for example assumptions will vary according to:

- Current age of horse.
- Sex of horse.
- Training centre, or quality of racehorse (if for example horses at elite training centres or quality racehorses may retire early for breeding).
- Type of racing undertaken, for example jump racers may be more likely to be injured and retire at younger ages.
- In order to determine how future costs may develop, it will also be necessary to make assumptions about new horses entering training at each age. These will also need to be considered in homogeneous groups as suggested above (by age, sex etc.).

(ii) Proposal (a)

This is broadly a final salary scheme with a uniform salary for all members.

As such, the owner has more certainty over the benefit which will be payable in retirement, making it easier to plan and put arrangements in place.

Investment risk falls on the fund and not on the owner/member.

Benefits are in the form of pension and so are not dependent on annuity rates at retirement.

The suitability of this proposal crucially depends on the basic amount of benefit provided for each year of a horse’s racing career. If the benefit is significantly less than the cost of care then the proposal may be unsuitable.

Clarification will be needed in respect of ill-health benefits. In particular whether accrued benefits be reduced to allow for early payment, or will be increased to allow for prospective racing career.

For horses that retire due to injury after a short career, an accrued pension may be too low to provide adequate benefits, particularly if cost of care for an injured horse is higher than normal.

The inflation factor will also affect the suitability of benefits.

The costs of providing for retired racehorses may not increase in line with general inflation or salaries. For example animal welfare issues may mean a higher inflation in costs than is expected.

Contributions are linked to breeding fees, so if benefits increase at a different rate to those fees the contribution rate may become volatile or unaffordable. The increase in costs of breeding (contributions based on breeding fees) may lead to fewer horses being bred. This could mean lower contributions to the fund than anticipated. This would impact on the sustainability of the contribution rate and scheme. This could be a particular problem at inception of the scheme as benefits to existing racehorses rely on funding based on future breeding fees.

Changes in demand for breeding (no of breeding fees) and cost of breeding fees will result in the contributions fluctuating. This could impact on the stability of the contribution rate, although there would be a lag between breeding fees (contributions) and future racehorse retirements (benefits).

This highlights the main risk – solvency of the fund (and hence security of benefits) and the reduction in benefits if the fund was unable to fulfil its benefit promises.

It is unclear where extra contributions would come from if the fund ran into a deficit. It may be difficult to meet a shortfall if, for example, breeding fees are falling.

#### Proposal (b)

This is a variant on a traditional money purchase scheme. As such there will be less certainty over the expected level of retirement benefits.

In particular, investment risk falls on the member/owner but there is also a possible upside from good investment returns.

Investment performance (and risk) will depend on the fund management choices available. A range of options would give flexibility, but having a single fund for all members/owners may be more practical given the ownership/membership profile.

Given the short term to retirement, a conservative investment policy may be appropriate, although this would lead to lower benefits (but involve less risk).

Complexity with investment options or administration could increase expenses (and lead to reduced benefits).

The benefits are in the form of a cash sum. As a result there is risk due to unknown costs of converting this cash into an income until the horse dies.

It is less likely that enhanced benefits would be payable on ill-health, likely payment would just be payment of allocated accumulated fund. Hence horses retiring early due to injury may not have suitable benefit provision.

Inflation protection is implicit with a direct link to invest proceeds. However, the risk of volatile contributions now falls on the member.

Breeding fee inflation will directly influence contributions and hence the level of benefits. This may not correlate with costs of retirement provision.

Contribution rates may need to vary by category to provide a similar level of benefit since costs could be very different across the population.

- (iii) This option is likely to significantly increase risks to the fund and probably contributions required. This is because the level of benefits to be paid is under the control of a third party.

There is less certainty over both the initial cost and how it will increase in payment. The risks of rising costs of retirement provision are now transferred from the owner/member to the fund.

In particular, increased costs due to regulation (more likely with formal providers) will be passed on to the fund.

It is possible that retirement farm providers will inflate costs to boost their income. There is also greater risk of fraud/collusion between horse owners and providers.

More formal providers will also look to make profits, which will increase costs.

Expenses will be incurred in monitoring and approving farms and in checking that claims are valid and reasonable. These expenses could be high.

Even so, should any farm provide poor care, there is a reputation risk to the fund as they may get the blame. Expenses could be incurred in sorting out any problems.

*Disappointingly answered. Many candidates appeared to be side tracked by the reference in the question to horses and horseracing. No specialist knowledge of the horse racing industry was required and candidates who approached this question as a benefit fund funding benefits for members scored higher marks.*

**6** (i) Identification of the objectives of the project.

Statements on how objectives will be met.

Quality standards for meeting the objectives.

The project sponsors role.

The role of any third parties.

Financial and economic objectives.

The expected cost of the project.

Financing policy for the project.

Policy for dealing with legal issues.

The need (if any) for insurance or reinsurance.

The technical policy.

A structured breakdown of the work to be completed under the project.

Key milestones for reviewing the project.

Risk management policy.

Communications policy.

Information technology policy.

Details of the project team.

Details of previous projects undertaken, including references if applicable.

- (ii) Contract risk. The exact terms and specification of the plant and delivery timelines will be set out in the contract. If the government has drafted the contract and full details are either not available or are ambiguous at the bidding stage there is a risk that the terms may be penal. This risk could be avoided by High Power specifying contract terms attached to their bid, i.e. specifying exactly what they would deliver under the contract.

Political risk. As the project is sponsored by local government, there may be a risk that funding is withdrawn or reduced due to changing budget constraints or priorities. This risk may be reduced by considering whether buy in from national government can be obtained as a guarantor for the project. The contractor should also consider whether the project is in line with stated policy aims and known budget constraints of the local government.

Reputational risk. This project is outside the normal area of expertise for High Power. As a result they may experience additional difficulties in managing the project, which could damage the reputation built up in their core areas of expertise. This risk could be reduced by bringing in market experts in hydro plant construction, or working in partnership with a third party who is established in this field and can help avoid known pitfalls in hydro plant construction.

Business continuity and external risks. Construction of the dam and plant could be seriously impacted by the local environment. In particular high rainfall, which would increase water flow, could make dam construction difficult leading to delays. This risk could be reduced by taking out business interruption cover, or specific insurance against conditions which would delay completion of the project.

Logistical risks. The transportation of building materials to the site may be difficult due to the location of this project (which must be near a large body of water and probably hills). In particular any geographical features of the region could lead to increased transportation quirks. As High Power has not operated in this field it may wish to sub-contract the movement of materials to a third-party on a fixed contract to transfer this risk.

Operational risks. While High Power will be familiar with the construction of power plants, it has no expertise in the construction of hydro plants. This could lead to uncertainty in terms of the time, cost and specialist expertise required to complete the project. Further research into similar projects, and research into the local region may reduce the uncertainty and risk associated with the project.

Environmental risk. Construction of a dam could have unintended consequences for the local area, for example flooding of the natural habitat of local wildlife – which could lead to objections from local residents. These risks could be reduced by engaging with local environmental groups to determine if there are any specific local risks.

- (iii) The company may have a sufficiently strong balance sheet to finance the project from its own cash reserves.

Whether cash reserves can be used will depend on the volatility of the reserves and whether this position can be sustained for the three year period as part of the company's business plan.

Alternatively there may be other projects undertaken by High Power with positive cashflow which could subsidise the project.

The opportunity cost will also need to be considered. For example, if there is a more effective way to use reserves.

The company could issue bonds to raise the finance required.

Bonds with a three year term would match the duration of the project and therefore rectify the cashflow difficulties placed on the project.

These could be unsecured, or alternatively linked to the dam and hydro plant providing additional security for bond holders. By securing bonds the rate of interest paid could be lowered, reducing the cost of finance.

Secured bonds could also be used to provide security in the event of late payments within the three year term. For example, providing increased security if there are any outstanding coupon arrears.

The company could enter a partnership with another party to share interest in the project. This partner may be willing to provide finance, while High Power manages the actual running of the project in exchange for a share of any profits.

This could also provide an opportunity to build relationships with the third party that could be used for future projects.

The company could consider making a rights issue to raise additional equity interest. However, the time involved in making a rights issue could make this a less practical option.

The company could consider taking a bank loan or using an agreed credit facility to finance the project. However, the ability to use any facility will be dependent on the terms attached and the willingness of the bank to maintain any agreement over the term of the project.

*Generally good answers, particularly for candidates providing wider answers. Most candidates scored close to the maximum parts for part (i). In part (ii) many candidates described a range of similar risks rather than wider distinct risks resulting in lower marks. In part (iii) many of the practical issues of managing cash flow timing were not identified.*

**7** (i) Travel delays or cancellation of public transport links.

Motor vehicle accident or breakdown, if driving to the festival.

Loss or damage of valuable items taken to the festival.

Vandalism of tents (or car) whilst at the festival.

Personal accident or injury.

Sickness, whether a broader condition or contracted at festival (e.g. food poisoning).

Death.

Cancellation of the festival.

Non-attendance of a high profile act.

Poor weather reducing the availability of festival facilities.

Loss of festival wristband.

Loss of mobile signal reception, leading to mobile text message alerts not being received in a timely manner.

Not having access to money at the festival, whether through loss of cash / bank cards or failure of cash machines.

- (ii) The cost of benefits is the amount that should theoretically be charged, so will depend on the frequency of claims and value of payments made.

To assess the frequency of claims the insurer will need to consider the proportion of visitors with a mobile phone.

It will then need to consider what proportion of those mobile phones may be damaged or stolen at the festival.

An allowance may be made for mobile phones covered by other insurance arrangements, for which a benefit payment may be excluded.

The number of thefts will be influenced by the level of security at the festival, as well as the profile of festival goers.

The cost of claims will depend on whether a fixed amount will be paid or if the amount paid will reflect the phone value. If a fixed amount will be paid then the costs will be more predictable.

If amounts paid will be variable and linked to the value of the phone, then the insurer will need to predict the value of phones. The insurer would then need to collect data on typical mobile phones owned by typical festival goers, broader information on the value of phones in the market may be available from other insurance policies – for example contents insurance – or from mobile phone retailers.

If only a proportion of a phone's value will be paid, or a maximum claim level is put in place this may improve predictability as well as reducing costs.

Moral hazard could significantly impact on costs. This could include visitors bringing more expensive phones to the festival, or an incentive to falsify claims in order to benefit from the insurance. The insurer may wish to consider whether exclusion clauses could be used to reduce the impact of moral hazard (i.e. reduce the possibility to falsify claims).

Claims underwriting will be required to avoid fraudulent claims. This may involve some verification that the phone was in the possession of the visitor on entry to the festival and pursuit of lost handsets to ensure they are lost.



The ideal source of data for theft would be based on number of phones stolen from the festival in previous years, but this is unlikely to be available. As a result it may be necessary to consider alternative data which may show similar characteristics.

Data from the festival in previous years is unlikely to be available in a meaningful form, or with a sufficient volume of data to make analysis credible. Alternative data may be available from other insurers, or possibly from police records if high level summaries are available for other events.

For damage to phones data may be more difficult to collect as typical breakages may not be reported with users just replacing handsets. It may be possible to obtain data on breakages from mobile phone retailers.

- (iii) If the event is cancelled then a refund will be paid to all visitors, so there will either be a large number of payments or no payment at all. This differs to the mobile phone cover where there are a larger number of (more) independent insured events.

This increases the volatility of total payments, making it more difficult to price.

Ticket price would be known in advance which means there would be no volatility of payment amount per claim.

Weather is difficult to predict in advance. The share of ticket price received will be agreed in advance but tickets may be purchased much nearer the date of the festival.

This means there is a risk of anti-selection, as nearer the festival the weather can be predicted more reliably. If there is a high chance of poor weather more visitors may choose to purchase gold band tickets.

Cancellation of the festival would be at the discretion of the festival organiser; this introduces an element of control into the cancellation event. With cancellation insured the organiser may be more inclined to cancel if the weather is poor.

There would also be the possibility that the event is cancelled for other reasons, there would need to be clear rules in place to avoid the weather being blamed for such cancellations to trigger an insured payment.

There could also be reputational risks to the insurer if a cancellation event occurred that was not weather related and gold band ticket holders did not understand why a refund would not be covered.

It may be possible for the organisers to take steps to reduce the chance of cancellation, for example by improving drainage at the site or providing pavilion areas. By encouraging, or insisting on these steps, the insurer may be able to reduce the probability of a claim.

- (iv) The price charged will be the cost of providing benefits plus the value of expenses and contribution to profit.

The contribution to profit may be positive or negative.

Expense of administering the benefits, including the cost of recording and holding details of visitors and their mobile phones.

Contribution to overhead expenses.

Insurance premium tax, or any other taxes.

No need to allow for commission as “policies” are only sold alongside festival tickets.

Capital cost for any upfront investment in infrastructure to support product.

Marketing to encourage take up of gold band tickets, and hence the policy. There may also be marketing costs at the festival to help festival goers appreciate the cover they have been provided.

If tickets are bought, and fees received well in advance of the festival date then there may be an allowance for investment income. This would also be considered if claims are likely to be paid well after the date of any claim.

Margins for contingencies.

Reinsurance costs if the insurer chose to take out reinsurance.

Contribution to profit, the level of which will depend on how the policy is to be used by the insurer – i.e. whether used to generate profit, or geared more towards marketing.

Consider the reserving requirements which may apply to the policy and if the insurer will have appropriate reserves to meet these or any other statutory requirements.

The price of insurance will need to be proportionate to the additional cost of a gold band ticket (compared to a silver band ticket). The additional cost must cover both insurance and other benefits, and there may be limited facility to tailor the price of gold band tickets to allow fully for insurance costs.

The insurer will also need to consider the share of ticket price received in the context of the sponsorship fees paid to the festival. Any difference between the insurance cost and the price charged could be seen as additional (or reduced) sponsorship money for the event.

There may also be consideration of an investment into an ongoing relationship with the festival organisers, if this insurance may be offered in future years as well.

*Question reasonably answered. Part (i) was answered well. In part (iv) the difference between having to pay all or no one for cancellation, compared with the mobile phone cover was not fully appreciated.*

## **END OF EXAMINERS' REPORT**