INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2020 Examinations

Subject SP1 - Health and Care Specialist Principles

Introduction

The Examiners' Report is written by the Chief Examiner with the aim of helping candidates, both those who are sitting the examination for the first time and 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. The Examiners have access to the Core Reading, which is designed to interpret the syllabus, and will generally base questions around it but are not required to examine the content of Core Reading specifically or exclusively.

For numerical questions the Examiners' preferred approach to the solution is reproduced in this report; other valid approaches are given appropriate credit. For essay-style questions, particularly the open-ended questions in the later subjects, the report may contain more points than the Examiners will expect from a solution that scores full marks.

The report is written based on the legislative and regulatory context pertaining to the date that the examination was set. Candidates should take into account the possibility that circumstances may have changed if using these reports for revision.

Mike Hammer
Chair of the Board of Examiners
July 2020

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A. General comments on the *aims of this subject and how it is marked*

1.The aim of the Health and Care Specialist Principles subject is to instil in successful candidates the ability to apply, in simple situations, the principles of actuarial planning and control needed in health and care matters on sound financial lines.

2. Candidates who approach the questions, especially the more substantial elements of each question, in a methodical and detailed manner are far more likely to satisfy the examiners and receive a pass in the subject. Candidates will gain few marks if they do not address the question asked but merely write around the topic of the question.

3. The mark allocation for each question part gives an indication of the relative length of answer or number of points to be made to gain full marks. The Examiners' Report covers more points than would be expected to get full marks. This is so that alternative approaches to questions by different candidates can be accommodated.

4. It is often helpful to structure and use subheadings when answering long part questions.

B. Comments on *student performance in this diet of the examination.*

The paper was a relatively straightforward one and well-prepared candidates scored well across most of the questions.

Questions that focussed on knowledge of the Core Reading were well answered by those who had prepared thoroughly. However, the paper included several part questions requiring wider thinking or application of core reading to specific circumstances, such as questions 4, 5, 6(ii) and 6(iii). Students should recognise that these are generally the questions which differentiate those students with a good grasp and understanding of the subject.

It is pleasing to see many candidates providing their answers under subheadings, making them easier to follow and mark. This also helps show that they have applied their knowledge to the specific scenarios described.

The comments that follow the questions concentrate on areas where the candidates could have improved their performance. Candidates approaching the subject for the first time are advised to include these areas in their revision.

C. Pass Mark

The pass mark for this exam was 60.
206 candidates presented themselves and 91 passed.

Solutions

Q1

(i)

The key criteria the insurer's claim experience would need to meet is:

Sufficiency - reasonable overall volume of stable data, such that the results of analysis are credible. [½]

Consistency - consistent data throughout. [½]

Accuracy - data are free from errors. [½]

Relevance - data used remain relevant for new business to be written, [½]

…from which future experience and trends can be deduced. [½]

Data should be reasonably up-to-date. [½]

Both exposure data and claim data must be consistent (principle of correspondence) by risk groups. [½]

The data should cover a long enough period such that the results of analysis are credible, [½]

…and enable any trends to be identified. [½]

There should be sufficient data to enable analysis to be divided into sufficiently homogeneous risk sub-groups, according to appropriate risk factors. [½]

[1/2 mark for listing at least 2 of these examples] Examples of standard risk sub-groups could include age, gender, occupation, smoker status. [½]

[1/2 mark for listing at least 2 of these examples] Examples of IP specific risk sub-groups could include deferred period, claim definitions (own / any occupation), guaranteed / reviewable premiums, benefit escalations. [½]

Within each risk sub-group, data cells should have sufficient data to be credible. [½]

Data cells could be based on number of policies (Lives) /claims or benefit amount (Amounts). [½]

Data should be in a suitable format to be input into the experience investigation model. [½]

Data should be easily and readily accessible. [½]

[Max 4]

(ii)

The number of years should not be so long that it covers time periods that include significantly different experience, [½]

…but not too short that the data is insufficient to produce credible rates. [½]

Care is needed to identify issues which could mean future experience is likely to be different to future experience. Such as the factors below: [½]

<u>Factors external to the health and care insurance company</u>

Changes over time about sickness and ability to work. [½]

Advances in medicine. [½]

Changes in the nature of work - e.g. move from manual to computer-based employment, leads to increase in stress related illness. [½]

Changes in legislation. [½]

Changes in government benefits. [½]

Changes in economic environment. [½]

The occurrence of any exceptional events (e.g. Pandemic). [½]

<u>Factors specific to the health and care insurance company</u>

The length of period over which the contract has been sold. [½]

Changes in underwriting procedures. [½]

Changes in claims management procedures. [½]

Changes in policy terms (e.g. claim definitions) and conditions. [½]

Changes in distribution or target market. [½]

Significant change in premium rates. [½]

Changes in reinsurance assistance. [½]

Changes in data quality (e.g. changes in data management systems / third party service providers). [½]

Changes in the business profile over time (e.g. selective lapses). [½]

The company's past approach / pricing policy to assumption setting. [½]

Number of years that gives consistency of data over all these factors is likely to result in too little data in risk cells, [½]

…so may need to aggregate data over these factors with some modifications. [½]

Data in the most recent months may be excluded from the experience investigation if incurred but not reported (IBNR) cases cannot be estimated with sufficient level of confidence. [½]

[Max 4]
[Total Max 8]

In general, most candidates scored reasonably well on both parts of this question. The better candidates were able to provide answers specific to the requirements of part (i) and part (ii), rather than repeating the same points between the two parts.

Part (i) was generally well answered, and most candidates identified that the key criteria of data requirements are sufficiency, consistency, accuracy and relevance. The better candidates were then able to generate further points to add further breadth and depth to their answers based on these core criteria.

Part (ii) was reasonably answered although some candidates simply repeated their answers

in part (i) which demonstrated a lack of understanding of the question being asked. The better candidates were able to make use of the criteria in part (i) and identify the factors that could support or invalidate those criteria. Candidates who used a structure to the answer (such as general, external, and specific to the insurer) managed to generate a breath in the answer and scored highly in this question.

Q2

Possible reasons why the other health and care insurance company's premiums quoted are lower than the competitor's:

<u>Product design</u> [½]

The terms and conditions may be different. [½]

Different claim definitions - health insurer own occupation, competitor any occupation. [½]

Competitor's premiums are reviewable whereas health insurer's premiums are guaranteed. [½]

Health insurer's product offers rehabilitation benefits. [½]

Competitor's product may have longer deferred periods, so lower inception rates and hence cheaper premiums. [½]

Benefit and premiums of health insurer may escalate at a higher rate than the competitor. [½]

Health insurer's cover may last for longer periods, e.g. to ages beyond normal retirement age. [½]

Health insurer's product may include waiver of premium benefits. [½]

Competitor's product may not include linked claims feature or offer a shorter linked claims period. [½]

Competitor may have a more comprehensive list of exclusions. [½]

<u>Pricing practice and assumptions</u> [½]

Commission to distributors may be in different shape or amount. [½]

Different profit targets (e.g. Internal rate of return (IRR), Return on capital (ROC)), competitor is willing to write the business as a loss leader, [½]

… or it has a high level of risk appetite / tolerance, and willing to accept lower profitability target/profit margin for the same business. [½]

Health insurer may consider that this to be a riskier market than its competitor's view. [½]

Competitor may have larger new business volumes so lower initial expense loadings per policy.

[½]

Competitor may have higher sales volumes so overhead costs on maintenance expenses

loading per policy is lower. [½]

Competitor may have larger average policy sizes, which helps reduce overhead costs per policy further. [½]

Competitor may have larger in-force IP portfolio so experience is more credible and lower pricing margins applied. [½]

Competitor may have better claims rates, [½]

…so better reinsurance terms can be negotiated and incorporated into pricing. [½]

Health insurer may have worse claims rates due to anti-selection. [½]

Competitor may have better retention rates (i.e. lower lapse rates). [½]

Competitor may be able to utilise existing deferred tax assets for pricing. [½]

Competitor may have lower pricing margins in its pricing assumptions due to lower level of volatility or uncertainty in experience. [½]

Competitor cross-subsidising at those points. [½]

Insurers assume different mix of business by gender. [½]

Competitor may be able to achieve higher investment returns on its assets backing liabilities. [½]

Competitor has different target markets. [½]

Competitor applies stronger underwriting controls than health insurer, [½]

…for example, health insurer may be using medical history disregarded / moratorium and the competitor may be using full medical underwriting. [½]

Competitor applies stricter claims controls than health insurer, [½]

…so lower number of fraudulent claims. [½]

Competitor may be a more efficient company and hence lower expense base, [½]

[*1/2 mark for listing at least 2 of these examples*] …e.g. automated underwriting and policy processing, economies of scale, cost-saving outsourcing arrangements. [½]

Competitor may be able to achieve higher level of capital / reserving efficiency, for example through diversification benefit from other operations within the group. [½]

<u>Other factors</u>

Not comparing like with like rates. [½]

E.g. competitor's rates may be net of premium taxes. [½]

Smoker rates for health insurer against non-smoker rates for competitor. [½]

Premiums quoted are for different occupational classes. [½]

The timing of the last pricing exercise could be different between the health insurer and the competitor, which leads to one set of premium rates to be more out-of-date than the other. [½]

Due to the relatively large differences in the premium rates, it is unlikely that the differences can be explained by random fluctuations in the claim experience of either insurer. [½]

One of the companies may have made some errors in its pricing. [½]

[Total Max 9]

Most candidates scored well on this question providing a wide range of possible reasons for the differences in premium rates between the two health and care insurers. The better candidates structured their answers using subheadings (such as product design, pricing practice and assumptions and other factors) managed in general a breadth of ideas and scored highly.

Q3

Proportional reinsurance [½]

Reinsurer covers agreed proportion of each risk. [½]

Administered automatically. [½]

Treaty required. [½]

All policies complying with treaty terms / scope must be ceded by the cedant, [½]

…and accepted by the reinsurer. [½]

For policies outside the treaty terms / scope (e.g. very large sum assured, high risk cases),

may be reinsured on a facultative basis, [½]

…where each policy will be negotiated individually between the cedant and the reinsurer,[½]

…and there is no obligation for the cedant to reinsure and the reinsurer to accept these policies. [½]

Enable larger risks to be accepted. [½]

There may be an upper limit above which liability for the excess reverts back to the insurer. [½]

Limits can be indexed. [½]

Proportion can vary as the insurer gains experience of new product or territory. [½]

Although variation usually applies to future new business, it does not normally apply retrospectively to the existing business. [½]

Proportion of reinsurance could be based on Sum At Risk instead of initial Sum Assured to

achieve a similar effect. [½]

Although this is a large and established insurer, if it is entering a new market assistance may be required, [½]

[*1/2 mark for listing at least 2 of these examples*] …which could include the provision of data for claims, pricing, underwriting, claims management. [½]

Proportional reinsurance does not cap the cost of any very large claims so may also need some excess of loss (XoL) cover. [½]

For proportional reinsurance, the reinsurance premiums can be determined under the original

terms (coinsurance) basis or risk premium basis.. [½]

Original Terms
The original terms (coinsurance) method involves a sharing of all aspects of the original contract and premium, [½]

…which include the profit margin of the original contract which may not be desirable for a large health insurer. [½]

Risk Premium
The risk premium method does not involve a sharing of all aspects of the original contract and premium. [½]

The reinsurer determines its risk premium specific for the risk based on its own assessment of the likely experience of the business, [½]

…which may be level over the term of the term of the policy or may vary annually with the probability of claim. [½]

Quota share (QS) [½]

Fixed proportion of each risk. [½]

Often used in this type of situation to spread risk, and write larger portfolios of risk. [½]

It could also improve the solvency ratio and satisfy the statutory solvency requirement. [½]

Reinsurer may want to have a significant participation in risk to compensate for expertise being provided. [½]

QS has disadvantage of ceding the same proportion of each risk, irrespective of size, [½]

…the insurer may prefer to cede a greater proportion of the larger risks than the smaller ones, owing to their greater loss potential. [½]

Financial assistance (new business strain, merger/acquisition, bolstering free assets) may be provided through a deposit back arrangement. [½]

For a large health insurer with a strong capital position, it is more commonly used for long-term products. [½]

The health insurer may still find QS arrangement useful for short-term products if the new business strain caused by writing such business has a material impact on its capital position. [½]

Surplus [½]

Cede all sums that exceed the retention for an individual policy. [½]

Used to write larger risks, which might otherwise be beyond its writing capacity. [½]

Major benefit is to enable the insurer to fine-tune its experience for the policies. [½]

Non-proportional reinsurance [½]

Reinsurer insures risks over/between limits rather than a specified percentage. [½]

Excess of Loss (XoL) reinsurance [½]

XoL allows an insurer to accept risks that could lead to large claims (large relative to its solvency position). [½]

Caps the cost a large claim, liability above a certain level being passed to a reinsurer. [½]

There may be an upper limit above which liability for the excess reverts back to the insurer. [½]

Usually several layers of cover can be from different reinsurers. [½]

Limits can be indexed. [½]

Reduces claims fluctuations and stabilises the technical results. [½]

Risk XoL [½]

Reduce exposure to single large claims. [½]

Depends on the type of business to be written as claims from individual business unlikely to be large enough for this to concern a large insurer, [½]

…but may still be useful for short term insurance such as PMI where the cover is on an indemnity basis. [½]

Aggregate XoL / Stop loss [½]

Reduce exposure to poor performing portfolio, [½]

…from any cause for specified period. [½]

A loss ratio is specified above which the reinsurer becomes responsible for all or the majority of further claims, [½]

…there is an upper limit loss ratio above which responsibility reverts back to the insurer. [½]

Also to protect against accumulations of risk especially if writing group business. [½]

Though likely to be expensive. [½]

Catastrophe XoL [½]

Reduce exposure to single (catastrophic) event, [½]

…which could be useful even for a large health and care insurer, [½]

…in particular against the occurrence of exceptional events (e.g. Pandemic). [½]

Financial reinsurance (Fin Re) [½]

Limited transfer of insurance risk from the cedant to the reinsurer, [½]

… therefore it is primarily a means of improving the apparent solvency position of the cedant. [½]

Unlikely to be needed if the large insurer has a strong solvency / capital position. [½]

On the other hand, Fin Re could be useful if the ceding company is entering a new market especially if writing long term lines. [½]

It helps the ceding company to relieve part of its new business financing requirement. [½]

The "loan" is usually presented as a reinsurance commission related to the volume of business reinsured. [½]

The "repayments" are calculated taking into account expected lapse experience and are added to the reinsurance premiums. [½]

An alternative approach is to make use of the future profits contained in a block of new business. [½]

[Total Max 13]

This question was a relatively straightforward one and most candidates scored highly on this question. Some candidates ignored the information given in the question in relation to the specific size and product range of the health and care insurer under question, and merely wrote around the topic of reinsurance, gained less credit than those who addressed the question directly.

Q4

(i) (a)

Complementary to state health care provision

A PMI policy may include benefits which are **complementary** to the state provision where:

The State provides a limited range of medical services and leaves it to the individual to fund the balance. [½]

The State provides certain health and care procedures 'free' at the point of delivery and insurance is mandatory for all other procedures. [½]

The state could provide basic cover, with any additional or specialised services provided via PMI. [½]

For example:

More screening services, e.g. annual general health assessment. [½]

More personalised health assessments for particular segments of the population. [½]

E.g. professional / elite sportspeople. [½]

Diabetics - additional services such as wearable blood sugar monitors. [½]

Services for patients with health conditions that do not quite (or not yet) meet the requirements to receive state support. [½]

E.g. people in early stages of dementia. [½]

Overweight but not classified as obese. [½]

Wellness services may be viewed as non-essential and as such will not be provided by the state and so could be covered under PMI. For example: [½]

advice on improving diet and nutrition, [½]

reducing alcohol consumption, [½]

quitting smoking, [½]

increasing physical activity / exercise, e.g. providing wearable devices. [½]

Private GP (family doctor) consultations, which can be obtained at much shorter notice than the state-provided services. [½]

Optical services such as glasses and contact lenses. [½]

Although the state may provide treatment for emergency eye issues, it is unlikely that it provides comprehensive cover of chronic conditions such as poor eyesight. [½]

Dental Treatments. [½]

The state may provide a limited number of screening services (e.g. one annual check per person) but people may want these more often or with greater flexibility. [½]

Dental hygiene services such as tooth polishing. [½]

Experimental procedures and medicines that may not be approved for use by the state providers, [½]

E.g. Acupuncture (or other relevant example such as massage). [½]

Procedures, medicines and operations that are very expensive, [½]

…and rarely required amongst the population and so they are not approved for use by the state providers could be covered under PMI. [½]

Funding to travel to other countries for treatments that are not available in the home country. [½]

Repatriation services for people who have accidents or fall ill whilst out of the country temporarily (on holiday or business trips). [½]

PMI cover could meet the cost of any excess or self-pay components of medicines provided under the state health care system. [½]

Funding the excess or self-pay components of any other area of health and care which is not fully-funded by the state. [½]

Care for long-term conditions that require a significant amount of personal and social care as well as medical (e.g. caring for people with dementia, people with mental health issues). [½]

Hospice care for people with incurable conditions and approaching the end of their lives. [½]

In this country it may be that the State provides everything only for segments of the population up to a certain salary/wealth level. [½]

Or there may be other rules about who does and who does not qualify to receive the state services. [½]

Then health and care insurance may be obligatory for all those who do not qualify for state services. [½]

If this is the case then the PMI product must include all the health and care services that are needed or expected by this segment of the population. [½]

[Max 9]

(i) (b)

Alternatives to state health care provision

PMI policies could offer alternatives to the health and care services that are currently offered by the state if there exists non-state providers of these services; [½]

and there exists demand for the services of these alternative providers. [½]

These alternative providers can provide:

a higher quality of service compared to the state services; [½]

a choice over who (which particular medical professional) treats the patient; [½]

a choice over place and time for treatment; [½]

reduced waiting time for treatment. [½]

For example:

Outpatient procedures, with shorter waiting time for treatment and higher quality facilities. [½]

Inpatient procedures, with shorter waiting time for treatment and higher quality facilities. [½]

Superior accommodation in the hospital such as a private room. [½]

Accommodation for family and friends. [½]

Better food and facilities such as television and wifi. [½]

Optical treatments such as laser-eye-surgery. [½]

[Max 6]

(ii)

Population segments

(a) Full-time students

Unlikely to be able or willing to afford large premiums. [½]

Young and so generally in good health. [½]

May be more likely to have accidents due to high-risk behaviour, [½]

…such as lifestyle choices, participating in adrenaline sports. [½]

May be prone to specific conditions, e.g. stress due to studying for exams. [½]

Less need for PMI due to likely state benefits available and cost of policies. [½]

Waiting periods less likely to be a problem as time may not be an issue. [½]

Except for emergency services, which may be covered by the state benefits. [½]

Students could be covered under their parents PMI policies. [½]

(b) Unemployed individuals

Unemployed individual is unlikely to be able to afford large premiums, [½]

…and being unemployed the individual will need to meet full cost of PMI as there is no employer to meet all or part of PMI cost. [½]

Working age so aged in the range 16 to 65 (depending on the country). [½]

Could be in worse than average health for their age. [½]

Indeed, this may be why they are unemployed. [½]

E.g. mental health conditions such as depression. [½]

Less need for PMI due to likely state benefits available and cost of policies. [½]

Waiting periods less likely to be a problem as time may not be an issue. [½]

Except for emergency services, which may be covered by the state benefits. [½]

(c) Retired individuals

Older than 60 so likely to be at higher risk for accidents and illnesses than the average population. [½]

Due to well-known effects and conditions of old age. [½]

Could be wealthy or poor. [½]

Much more likely to have long-term health conditions than younger members of the population. [½]

Waiting periods may be a problem so may wish to purchase cover for this. [½]

May feel that they have already paid for benefits through tax whilst working. [½]

PMI cover may have been paid for by employer when working but perhaps less likely to be maintained in retirement as individual will need to fund the full cost themselves. [½]

Cost of PMI cover at older ages could be prohibitive for all but the wealthiest retirees. [½]

Ill-health retired individuals are more likely to have need for medical cover, but at a higher costs than the healthy individuals. [½]

(d) Retired military personnel of working age

A significant proportion may have serious injuries from their time in the military. [½]

E.g. limb amputations. [½]

Post-Traumatic Stress Disorders. [½]

Other subgroups may be in good health if they survived their time in the military without suffering serious injuries. [½]

There may be existing generous state support for this group compared to other segments of the population. [½]

State may only be willing to cover cost of medical conditions that have come directly from individual's military service. [½]

Retired military personnel could seek alternative employment post retirement from the military service, and the need for PMI cover could be affected by the employment status post retirement. [½]

[Max 8]
[Total Max 23]

This question, which required candidates to apply their knowledge of the benefits under a PMI product, was not well answered (in particular part (i)). This question differentiated those candidates with a good grasp and understanding of the subject.

Part (i) was not well answered. The better candidates were able to distinguish the difference between benefits that are complementary and benefits that are alternative to the state provision, providing a definition of what complementary and alternative referred to in a PMI context and identifying the supporting reason for the benefit under each area. Many candidates failed to address the command verb "Propose, with reasons" in the question, which required a reason to be provided, and therefore simply listing and repeating benefits under each area was not satisfactory.

Part (ii) was reasonably well answered. The better candidates considered multiple dimensions regarding why a person may or may not have their needs met by a PMI product. Some candidates suggested and defined alternative products, which was not required in the question and gained them no credit.

Q5

(i) (a)

A discounted cash flow approach would typically be used for calculating reserves for long-term insurance policies with guaranteed premiums. [½]

Reserves for each policy (or some grouping of policies could apply) are typically calculated as the present value of expected future net cashflows on the policy, discounted using an appropriate discount rate. [½]

Projection periods need to cover the entire remaining policy term. [½]

Net future cashflow for each future period (which would typically be monthly or annual cashflows) will be calculated as:

Future premiums [½]
less Future claims [½]
less Future claims handling expenses [½]
less Future administration expenses [½]
less Future commissions (outstanding initial commission, renewal commission) [½]
plus Commission clawbacks on lapses [½]

Future claims would be calculated as expected critical illness rates multiplied by sum assured. [½]

There should be suitable allowance for prudence margins. [½]

[*1/2 mark for listing at least 2 of these examples*]…For example, higher claims rates, higher expenses, higher expense inflation, lower lapses for policies with positive reserves. [½]

Probability of certainty or confidence level may be used as the basis of determining the level of prudence margins. [½]

For example, the level may be set to ensure that the additional margin will provide X% (typically between 75% to 95%) confidence level that all future expected cash outflows will be sufficiently met. [½]

The assumptions should also take into account any expected future changes that may affect future experience. [½]

Allowance for future expenses needs to take into account both overheads and directly attributable expenses, [½]

…and future expense inflation. [½]

The effects of any reinsurance arrangements should be allowed for appropriately. [½]

Negative reserves may be eliminated or zeroised. [½]

Other reserves that would need to be consider include:

[*1/2 mark for listing at least 2 of these reserves*] Incurred But Not Reported (IBNR), Reported and Not Yet Settled and Option reserves. [½]

IBNR can be calculated based on experience investigation on claims reporting delays and derive factors applicable to either premiums or expected claims. [½]

Reserves for claims that have reported and not yet fully settled can be assessed on a case by case basis using actual policy information. [½]

Option reserves: additional costs that need to be set aside for the eventuality that a particular option "comes into the money", i.e. becomes more valuable in its exercise than in its discard. [½]

Depending on the nature and materiality of options, option reserves could be calculated using either a deterministic or stochastic approach. [½]

Assumptions

Discount rate is generally derived based on the expected return on assets backing liabilities, with appropriate allowance for credit risk and prudence margin. [½]

All assumptions should be based on the last experience investigations. [½]

The Insurer must take into account all relevant available data, both internal and external, when arriving at assumptions that best reflect the characteristics of the underlying insurance portfolio. [½]

These would include assumptions for claims, expenses (initial, renewal / maintenance, termination), mortality, critical illness and lapses. [½]

Reporting delay assumption is required for IBNR reserves. [½]

Option take-up rate is required for option reserves. [½]

[Max 5]

(i) (b)

The reserves for short-term insurance policies would typically include:

[*1/2 mark for listing at least 3 of these reserves*] UPR, URR, IBNR, Outstanding claims reserve, IBNER, Equalisation or Catastrophe reserves, Claims in transit. [½]

Unearned premium reserve (UPR) can be calculated as the balance of premiums received in respect of periods of insurance not yet expired. [½]

Unexpired risk reserve (URR) can been calculated as the excess of the expected ultimate claims (which would typically be based on loss ratios) and expenses over the unearned premium reserve. [½]

IBNR can be calculated based on experience investigation on claims reporting delays and derive factors applicable to either premiums or expected claims. [½]

Outstanding claims reserve in respect of claims notified to the insurer but not yet fully settled can be assessed on a case by case basis using actual policy information. [½]

Incurred but not enough reported (IBNER) can be calculated as per IBNR above. [½]

Equalisation or catastrophe reserves can be calculated by stressing the claims experience based on an 1-in-N year event [N can be any sensible number, such as 20, 50, 100, 200 etc]. [½]

Claims in transit reserve is in respect of claims reported but not assessed, or not recorded, and can use similar methodology as per the outstanding claims reserve above. [½]

<u>Assumptions</u>

Assumption on the premium earning patterns are required for the UPR. [½]

Claims and expenses assumptions are needed to evaluate the unexpired risk reserves. [½]

The Insurer must take into account all relevant available data, both internal and external, when arriving at loss ratios that best reflect the characteristics of the underlying insurance portfolio. [½]

Reporting delay assumption is required for IBNR reserves. [½]

For both (a) long-term business, and (b) short-term business, statuary valuation methodology and prudence margins may be prescribed by the regulator. [½]

[Max 3]

(ii)

<u>Long-term insurance</u>

For long-term insurance policies, the discounted cashflow approach would still be the appropriate methodology. [½]

Assumptions will be derived based on the actuary's best estimate of future realistic experience, [½]

…i.e. prudence margins allowed for in the statutory assumptions would be removed. [½]

All experience items will be allowed for explicitly (expenses, persistency, investment return, morbidity and mortality). [½]

There would generally be no elimination of any negative reserves (unless regulations do not

permit these to be held). [½]

IBNR will also be assessed based on a realistic assessment of claims reporting delay. [½]

Reserves for claims that have been reported and not yet fully settled are expected to be the same as they do not normally require actuarial judgement. [½]

A stochastic approach may be preferred for the calculation of option reserves. [½]

Any other contingency reserves would not be required under a best estimate basis. [½]

Short-term insurance

The Unearned Premium Reserve is based on office premiums which includes allowance for profit and other margin, [½]

…and is therefore not appropriate as a best estimate approach. [½]

The discounted cashflow approach would be used. [½]

Reserves for policies would typically be the discounted value of future expected claims, expenses and premium cash flows. [½]

Premium cash flows could be zero if all the premiums are paid at policy inception / renewal date. [½]

Discount rate could be derived based on the expected return on assets backing liabilities, although it may be ignored due to the short term nature of the policies. [½]

Projection periods need to cover the entire remaining period until the next renewal date. [½]

The realistic effects of any reinsurance arrangements should be allowed for appropriately. [½]

Outstanding claims reserve, incurred but not enough reported and claims in transit reserves would be the same as above. [½]

Incurred but not reported (IBNR) would be determined based on a realistic assessment of claims reporting delay. [½]

Contingency, Equalisation or catastrophe reserves would typically be removed. [½]

For both (a) long-term business, and (b) short-term business, best estimate valuation methodology may be prescribed by the regulator. [½]

[Max 4]
[Total Max 12]

In general, this question was not well answered which differentiated those candidates with a good grasp and understanding of the subject.

Part (i) was reasonably well answered with the better candidates addressing the command verb "Describe" and providing a detailed description of the reserving methodology and assumptions rather than listing types of reserves. Some candidates failed to demonstrate a clear understanding of the difference between a long-term product with guaranteed premiums

and a short-term product with reviewable premium in reserving methodology

Part (ii) was poorly answered. Many candidates could not get further than just stating that there should be no prudence margins in best estimate reserves. The better candidates used their answers to part (i), assessed each item individually and articulated how the methodology and assumptions may differ between a supervisory and best estimate reserve calculation.

Q6

(a) Deferred period

The period of incapacity before any benefit is paid. [½]

Common deferred periods are 4, 13, 26 and 52 weeks. [½]

[Max 1]

(b) Replacement ratio

The ratio of net (in benefit) income to net pre-disability income. [½]

It can be net income tax (or gross of income tax). [½]

A value of less than 1 is desirable to provide a financial incentive for the claimants to return to work. [½]

May be adjusted for State benefits or similar. [½]

[Max 1]

(c) Proportionate benefit

A reduced benefit paid to a claimant, [½]

…if they take up employment in an occupation that is different from the one from which they were originally incapacitated. [½]

The reduction relates to the ratio that the gross earnings from the new job bear to those from the occupation against which disability was being claimed. [½]

The proportionate benefit will only be paid whilst disability from the original occupation continues. [½]

Usually a full claim must have been established before a proportionate benefit can be claimed. [½]

[Max 2]

(d) Rehabilitation benefit

A benefit payable when a claimant is no longer totally unable to follow his or her original occupation and returns to it in a reduced capacity. [½]

The amount of benefit is usually calculated in the same way as that for proportionate benefit. [½]

It can also describe the process of counselling, [½]

…whereby disability counsellors assist disabled persons with advice on practical matters to do with the benefit and their disability, in order to aid a return to work. [½]

[Max 2]

(ii)

Monthly Premium = (Monthly premium rates per 100 per month of benefit) / 100
x (1 + Rating factor)
x Benefit amount per month
+ Policy fee

[½]

Policy A

Policy anniversary	Benefit amount per month	
01/05/2015	200	
01/05/2016	200 x 1.05 = 210	[½]

Maximum replacement ratio 300 x 80% = 240 [½]

Benefit at date of claim notification = lower of (210, 240). i.e. 210 [½]

Calendar year	Annual increase	Policy fee
2015		2.00
2016	Minimum (2%, 2.1%)	2.00 x (1.02) = 2.04

[½]

Monthly Premium at date of claim notification = 7.80 / 100
x (1 + 50%)
x 210
+ 2.04 [½]
= 26.61 [½]

Policy B

Policy anniversary	Benefit amount per month	
01/01/2016	500	
01/01/2017	500 x 1.05 = 525	
01/01/2018	525 x 1.05 = 551.25	[½]

Maximum replacement ratio 400 x 80% = 320 [½]

Benefit at date of claim notification = lower of (551.25, 320). i.e. 320 [½]

Calendar year	Annual increase	Policy fee	
2015		2.00	
2016	Minimum (2%, 2.1%)	2.00 x (1.02) = 2.04	
2017	Minimum (2%, 1.5%)	2.04 x (1.015) = 2.07	
2018	Minimum (2%, 1.0%)	2.07 x (1.01) = 2.09	[½]

[*Note - It is possible from the wordings of this question to interpret that the benefit amount is ONLY restricted to a maximum of 80% of Replacement Ratio at disability, and hence the premiums are still determined using the original benefit amount increased by the escalation rate, as per Approach 2 below.* ***Equal marks should be awarded for either approach.***]

Approach 1 - using benefit amount of 320

Monthly Premium at date of claim notification =		6.50 / 100	[½]
		x (1 + 0%)	
		x 320	
		+ 2.09	
	=	22.89	[½]

Approach 2 - using benefit amount of 551.25

Monthly Premium at date of claim notification =		6.50 / 100	[½]
		x (1 + 0%)	
		x 551.25	
		+ 2.09	
	=	37.92	[½]

[Max 4]

(iii)

Policy A

Policy anniversary	Benefit amount per month	
01/05/2016	210 (as per (iii) above)	
01/05/2017	210 x 1.05 = 220.5	[½]
01/05/2018	220.5 x 1.05 = 231.53	[½]
01/05/2019	231.53 x 1.05 = 243.10	[½]
Benefit payment in 2018 =	220.5 x 4	[½]
+	231.53 x 8	
=	2,734.2	[½]
Benefit payment in 2019 =	231.53 x 4	[½]
+	243.10 x 8	
=	2,870.91	[½]

Policy B

Policy anniversary	Benefit amount per month	
01/01/2018	320 (as per (iii) above)	
01/01/2019	320 x 1.05 = 336	[½]
Benefit payment in 2018 =	320 x 12	[½]
=	3,840	[½]
Benefit payment in 2019 =	336 x 12	[½]
=	4,032	[½]

[Max 4]
[Total Max 14]

Part (i) which is bookwork was well answered.

Part (ii) was not well answered. The better candidates laid out their calculation step-by-step, split by the different policies and stated any assumptions they made throughout their calculations.

Part (iii) was not well answered. Similar to part (ii), the better candidates showed workings which allowed for additional marks to be awarded (even where computational errors had emerged).

Parts (ii) and (iii) of this question differentiated the better prepared candidates.

Q7

The document should define the **aims** of an income protection product, [1]

…to enable the potential policyholders to understand fully the product that they are purchasing meets their needs [½]

The aim of an income protection insurance product is to replace part of the income that the insured life would have earned if they are unable to work due to accident or illness. [½]

It should state that the benefit is in the form of a regular income. [½]

A description of the insured event that gives rise to this benefit being paid. i.e. the inability of the insured life to work (referred to as incapacity) through illness or accident. [½]

Define the situation or circumstances that need to exist in order that the benefit becomes payable. [½]

Define under what circumstances that the benefit will cease. [½]

Define other features / benefits available. [½]

[*1/2 mark for listing at least 3 of these features*] E.g. Rehabilitation benefit, partial / proportionate benefit, waiver of premium benefit, hospitalisation benefit, continuous cover, linked claims period. [½]

State the situations that are not covered by the policy. For example, unemployment, redundancy, early retirement and reluctance to return to work. [½]

Define the replacement ratio to allow the policyholders to decide the amount of income protection they require. [½]

Define any policy limits. [½]
Define the minimum period (waiting period) from policy inception before any claim is accepted as valid. [½]

Explain the differences between level and escalating benefits. [½]
For escalating benefits, state whether benefit escalation would be different in and out of claim. [½]
Define the deferred period to allow the policyholders to decide how soon they need the income protection benefit to start after they suffer the incapacity. [½]

Define the policy term (e.g. fixed term or expiry age) to allow the policyholders to decide how long they want the cover to last. [½]

State the circumstances under which premiums would cease (e.g. claim, surrender, death).[½]

Explain the differences between level guaranteed premiums and reviewable premiums. [½]

For reviewable premiums, state what would determine the reviewable premiums on review. [½]

State areas of the world outside the policyholders' country of residence where the policyholders may temporarily reside with full coverage continuing. [½]

Outside of these territories, the insurer would ask to be advised of change of residence (for longer than a limited period) so that the terms of the contract might be reconsidered. [½]

Explain what other policy options (e.g. guaranteed insurability options) are available. [½]

State what the policyholders will need to do if they change their occupation. [½]

Explain any tax implications. [½]

State the period (e.g. cooling off period) within which the policyholder can cancel the contract without incurring any financial penalty. [½]

Set out the procedures to follow if the policyholder wants to make a compliant. [½]

State how the customer data is used in line with relevant data protection rules. [½]

The document should define the policyholders' **commitments,** [1]

…to ensure that the potential policyholders to understand fully their obligations to ensure the ongoing validity of the policy. [½]

This would include the provision of all the medical and other information the insurer asks for at the application and claim stages. [½]

The policyholders' commitment to pay the premiums for the duration of the policy. [½]

The policyholders' commitment to notify the insurer any claim within a specified period of becoming incapacitated. [½]

The policyholders' commitment to select the level of cover they need and review the level regularly to ensure that it continues to meet their needs. [½]

The document should define the **risk factors** that the policyholders should be aware of, [1]

…to ensure that the potential policyholders to understand fully the potential risk they may face by purchasing this policy. [½]

The risk that the insurer may not pay a claim if the policyholders provide inadequate/ inaccurate / false information at the application and claim stages. [½]

The risk of termination of policy if the policyholders do not keep up with their premium payments. [½]

The risk that the premium increase under a policy with reviewable premium rates is higher than the policyholders' expectation. [½]

The risk of a reduction in benefit payment if the policyholders' earnings at the time they claim have reduced from the level they provided at application. [½]

The risk of not receiving some state benefits because they receive the income protection benefit. [½]

Other possible reasons

To ensure the customer is treated fairly [½]

Regulation may specify some aspects of what should be included in the documentation. [½]

[Total Max 10]

Most candidates provided reasonable answers covering the key information specific to an individual IP product. The better candidates thought through the whole lifecycle of obtaining the product from quoting, underwriting, risk commencing, premium paying, claiming, recovering to termination, which enabled them to score highly on this question. Some candidates ignored the guidance given and did not provide reasons why the key information they listed should be included in the key information document, which was not sufficient to enable them to score well.

Q8

(a)

View of insurer

Probable impact => beneficial

Sales

If more affordable to individuals, all else being unchanged, this should increase demand for PMI business. [½]

If more affordable to employers, all else being unchanged, this should increase demand by employers. [½]

This will generate higher sales volumes for insurers. [½]

A change in tax may increase the awareness of IP policies, which could lead to higher sales volumes for insurers. [½]

And higher profits (assuming the business is profit-making for insurers). [½]

Higher sales volumes will lead to thinner spreading of overhead, which should increase profits. [½]

Pricing

Insurers may decide to take the opportunity to increase their office premiums by a small amount (less than 10%) so that the policyholder is still getting a lower premium compared to before. [1]

This would increase the profit margin for insurers. [½]

Absolute profits would increase further if sales volumes also still increase. [½]

Claims amounts

With higher sales volumes, insurers will have more power to negotiate lower fees with health and care providers (e.g. hospital networks). [½]

Which will reduce cost of claims on average. [½]

This will further increase the profitability of the business. [½]

Probable impact => none

Sales

Little impact on the sales if the market is already saturated. [½]

If quality of state provision is already at a high level, the reduction in PMI premiums may not have material impact on the demand for PMI policies. [½]

Probable impact => detrimental

Sales

An increase in demand may cause new business strain, [½]

…increase capital requirements, [½]

…and increase administrative / resources strain. [½]

Higher competition as new players may enter the market with either traditional or new products. [½]

View of consumers

Probable impact => beneficial

Pricing

PMI will become more affordable for individuals. [½]

PMI will become more affordable for group policyholders. [½]

Product offerings

As demand increases, existing insurers may expand their product range, [½]

…which may include cover for health and care services that were previously unaffordable. [½]

Higher competition could lead to more choices of insurers and potentially cheaper premiums as new players entering this market. [½]

Probable impact => none

Employers may previously be able to avoid the premium tax if PMI for employees was treated as a business expense. [½]

If this was the case then reducing the premium tax will have no effect for group policyholders. [½]

Probable impact => detrimental

Higher demand for private health and care services could lead to lower service standards caused by resources strain. [½]

For the segments of population that cannot afford PMI policies, they will receive no direct benefits as a result of this tax reduction. [½]

[Max 7]

(b)

View of the Government

Probable impact => beneficial

Politically, this could be considered as a positive move by some segments of the population (in particular those who can afford PMI policies). [½]

If more people have PMI cover then this could reduce demand for services from the public providers. [½]

Possibly allow the government to reduce spending public funds on these services. [½]

As private provider services expand, it will further take away demand from the public providers. [½]

It may encourage private providers to increase the range of services they offer, e.g. private GP consultations. [½]

The government could receive higher income from taxation if the increase in sales volumes outweighs the reduction in premium tax. [½]

More affordable PMI cover may help improve population health, [½]

…which could lead to high productivity and hence GDP. [½]

Probable impact => none

If people with PMI need a referral from a state general practitioner (GP), the increase in PMI services may have less impact if the PMI products include private GP consultations. [½]

Probable impact => detrimental

This may not be viewed favourably by the segments of the population that cannot afford PMI cover. [½]

If people with PMI need a referral from a general practitioner in the public system in order to access private providers then it may increase demand for GP consultations. [½]

The government may receive less income from taxation and this may mean it has lower funds available to spend on the public health care providers. [½]

Higher demand for private health and care services could lead to higher demand for health and care worker, [½]

…which could lead to the public sector losing health and care resources to the private sector. [½]

The reduction in public sector health and care resources could lead to lower state health and care service standards. [½]

View of the health and care providers

Probable impact => beneficial

With more insured members, private health and care providers will have more demand for their services. [½]

This may allow them to charge higher prices, [½]

… and expand their businesses. [½]

Probable impact => none

There may be no overall impact on profit if fees are negotiated down, due to increased demand, as volumes increase. [½]

Probable impact => detrimental

Waiting times for public services may reduce, and therefore reduce the attractiveness of using private providers. [½]

The increase in business size of insurers may provide them with greater power to negotiate lower fees. [½]

Higher demand for private health and care services could lead to resources strain, [½]

…which could lead to service standards being lower than expected by insurers and policyholders. [½]

Higher demand for private health and care services could encourage new entrants into the private health and care market and hence more competition. [½]

[Max 4]

[Total Max 11]

In general candidates scored reasonably well on this question providing a wide range of probable impacts which could be positive, neutral or negative. The better candidates structured their answers into different subheadings and probable impacts, generally providing a breadth of valid points and scoring highly on this question.

END OF EXAMINERS' REPORT