

# **INSTITUTE AND FACULTY OF ACTUARIES**

## **EXAMINERS' REPORT**

September 2016

### **Subject ST1 – Health and Care Specialist Technical**

#### **Introduction**

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 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.

Luke Hatter  
Chair of the Board of Examiners  
December 2016

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

1. The aim of the Health and Care Specialist Technical 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 approached the questions, especially the more substantial elements of each question, in a methodical and detailed manner were 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. 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.
3. It is often helpful to use subheadings when answering long part questions.
4. Candidates who give well-reasoned points, not in the marking schedule, are awarded marks for doing so.

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

Overall, the paper was of a slightly harder level than recent papers although well-prepared candidates scored well across most of the paper. As usual, questions that focussed on knowledge of the Core Reading were well answered by those who had prepared thoroughly. However, questions requiring wider thinking or application of core reading to specific circumstances, such as question 3, were often less well answered and students should recognise that these are generally the questions which differentiate those students with a good grasp and understanding of the subject. 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 concentrate their revision in these areas.

**C. Pass Mark**

The Pass Mark for this exam was 57.

## Solutions

- Q1** (i) An unexpired risk reserve is a reserve in respect of the unexpired insurance premium where it is felt that the premium basis is inadequate to meet future claims and expenses. [1]  
The premiums are based on the pricing assumptions at the time these contracts were issued. [½]  
A URR might be required for example, if there were an expenses overrun [½]  
The expense overrun could be in relation to policy maintenance or claims handling [½]  
Other reasons for a URR could be:  
pricing errors in the premium calculations or [½]  
more claims than expected [½]  
e.g. due to medical advances (*or other suitable example*) or [½]  
higher claim amounts than expected [½]  
e.g. due to medical inflation (*or other suitable example*) [½]  
The insurer may have deliberately underpriced the business to be competitive and gain market share [½]  
[Maximum 2]
- (ii) The approach is to project forward expected future cash outflows. [½]  
and calculate the present value by discounting these cash outflows using an appropriate interest rate. [½]  
The cashflow approach allows for the proper timing of cashflows. [½]  
The cashflow approach is very flexible (allowing for variations in assumptions over time, more complex product designs etc.). [½]  
If risk is assumed to be uniform over time, the UPR can just be calculated as the proportion of premium that reflects the unexpired period ... [½]  
... with an adjustment for the part of the premium required to cover initial expenses [½]  
If risk is assumed non-uniform, an allowance should be made for seasonality of claims. [½]  
If the present value calculated is in excess of the UPR, then an additional URR will be required. [½]  
The choice of discount rate would take into account the return required by the company [½]  
and the level of statistical risk attached to the cashflows. [½]  
Alternatively, discounting could be ignored for prudence purposes. [½]  
In addition, discounting is unlikely to be material for short-term insurance contracts such as PMI. [½]  
Projection periods need to cover the entire remaining period of exposure and claim payment runoff. [½]  
Future cash outflows will be calculated as:  
Future claims [½]  
plus future claims handling expenses [½]  
plus future administration expenses [½]  
Allowance can be made for taxation and investment income [½]  
These cashflows should be in relation to all business in-force at the valuation date [½]

and, possibly, depending upon local statutory requirements, should also cover any signed contracts that will renew or start in the future (so are not in-force at the valuation date but will definitely be a future liability). [½]

All assumptions should be based on the latest 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 claims, expenses and lapses. [½]

Sensitivity testing may be used to refine the key assumptions. [½]

There should be suitable allowance for prudence margins. [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 reserve held as the URR over and above the UPR will provide X% (typically between 75% to 95%) confidence level that all future expected cash outflows will be sufficiently met. [1]

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

such as changes in future medical inflation [½]

or morbidity experience (*or other suitable examples*). [½]

Allowance for lapses may be ignored if it proves to be more prudent to do so. [½]

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

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

Contractual options and guarantees need to be allowed for. [½]

For some of these, a market consistent simulation or stochastic analysis may be the most appropriate calculation approach. [½]

Although a deterministic approach could be acceptable depending on the risks involved and the materiality. [½]

The adequacy assessment should be carried out at an appropriate level of segmentation allowing for homogenous risk groupings. [½]

The cashflow projections should ideally be performed on a policy by policy basis for high sums assured. [½]

However approximations are permitted and grouped model points can be used provided certain conditions are met, including validation of accuracy. [½]

The total adequacy assessment results will aggregate the results across the individual homogeneous groups. [½]

Offsetting effect between different groups may be allowed for so that profitable and loss-making business can be offset against each other at the company level. [½]

[Maximum 9]

[Total 11]

Part (i) was generally well answered, although not all candidates gave reasons why an unexpired risk reserve might be required.

Part (ii) was generally not well answered. Whilst most candidates could describe how to use a basic cash flow projections approach, relatively few discussed aspects such as the choice of discount rate, margins for prudence, allowing for reinsurance arrangements or contractual options and guarantees.

**Q2** Specific considerations for this particular insurer are as follows:

**Limitation of exposure to risk** [½]

The insurer faces an uncertain future and the claims outgo from any period of risk cannot be predicted to any degree of accuracy. [½]

The small size of this insurer may mean that availability of past data is relatively less credible limited than the larger insurers. [½]

As it is also going through a phase of significant growth, there is higher uncertainty on the relevance of historic data as the business profile could have changed significantly. [½]

As its critical illness is well established in the market, its experience in the market place may reduce the needs for reinsurance. [½]

This is however not the case for its income protection business as it has only recently started writing this business. i.e. very limited market experience. [½]

The insurer may wish to limit its exposure to any new critical illnesses that get added over time. [½]

For IP, the insurer may be particularly uncertain about trends, such as attitudes to claiming, fraudulent claims etc. [½]

**Avoidance of large single losses** [½]

What is large to an insurer will depend on the size of the free assets available. [½]

The relatively low solvency ratio and hence low level of available free assets. [½]  
and the insurer being small means that this insurer may have higher appetite for offsetting its risks by using reinsurance. [½]

This is because given its low solvency ratio, a claim or combination of claims could have material (negatively) detrimental effect on business results and, at the extreme, solvency. [½]

This may occur due to a single event (e.g. outbreak of insured disease) [½]  
and/or a concentration of risk in a particular territory [½]

or a concentration of CI claims by illness (e.g. following a national screening program) [½]

or a concentration of IP claims by cause (e.g. claims relating to mental health, if these are becoming more widely accepted/reported) [½]

or a large single loss (e.g. a CI policy with a high sum assured, a very long IP claim). [½]

Reinsurance will help protect the insurer's solvency in the case of the critical illness portfolio because of the lump sum benefit feature [½]

and also help protect liquidity [½]

For the income protection portfolio, the need for reinsurance is predominantly for solvency as the regular payments benefit feature will have less implications on the insurer's immediate liquidity position. [½]

**Smoothing of results** [½]

The principle whereby reinsurance covers the larger risks or accumulation of smaller risks above certain limits helps to achieve a smooth development of accounts year-on-year. [½]

This can be helpful for a small insurer as results may be more volatile overall than for a large insurer. [½]

This is particularly the case for the income protection portfolio as it is relatively immature. [½]

The fact that this insurer is growing rapidly adds further uncertainties over the predictability of its net underwriting results. [½]

Reinsurance is therefore important for this insurer to reduce its expected morbidity experience. [½]

A more stable sets of financial results are likely to be more acceptable to shareholders and regulators. [½]

**Availability of expertise** [½]

The insurer is new to income protection business, the reinsurer can help with product design, [½]

rating/pricing, [½]

underwriting and [½]

claims management (*or other suitable example, e.g. sales literature, policy wording, reserving*) [½]

There is arguably less need for assistance from reinsurer in respect of its established critical illness business. [½]

However, the insurer may still require reinsurer's expertise on its critical illness business in product innovations given its ambitious growth plan [½]

and there may be risks if new critical illnesses are added. [½]

There may be unusual risks that reinsurers can provide expertise on such as unusual illnesses for CI and unusual occupations for IP. [½]

Reinsurance expertise may be needed if the insurer is considering "significant growth" in a new territory. [½]

Once the insurer's expertise and confidence has grown, the reinsurer's involvement will reduce. [½]

**Increasing capacity to accept risk** [½]

Owing to its low solvency ratio and insufficient capital backing, this insurer may be reluctant to accept, or incapable of accepting, particular risks by sector or by volume. [½]

or large single risks. Reinsurance cover can assist in this situation ... [½]

...particularly as the insurer is small. [½]

Accepting different types of business leads to greater diversification, which will be particularly important for the IP business ... [½]

... and should also help the insurer to establish itself in the new market [½]

and also potentially gain a capital advantage from diversification which would not be possible if the insurer retained all its risk. [½]

The solvency requirements for a particular line of business are normally reduced in line with the proportion ceded, though this may be subject to an upper limit. [½]

**Financial assistance (new business strain, merger/acquisition, improving free assets)** [½]

For the company as a whole, financial assistance will help improving free assets and hence solvency ratio. [½]

There may also be the need to help financing business growth. [½]

For the income protection business, financing may be needed for costs of product development, marketing campaign and covering new business strain. [½]

For the established block of critical illness business with significant value of inforce (VIF) based on future surpluses, financial reinsurance could be a means for the insurer to capitalise VIF immediately. [1]

e.g. the insurer could use financial reinsurance where the regulations allow credit to be taken for a loan in respect of the future profits and the insurer does not need to reserve for the repayment of the loan in its supervisory returns. [½]

Financial assistance might be provided via reinsurance commission under an original terms arrangement. [½]

Financial assistance could be done in respect of existing business or new business. [½]

**Other factors**

There may be opportunities for solvency arbitrage (if the reinsurer is subject to different solvency requirements to the insurer) [½]

or tax arbitrage. [½]

There may be a regulatory requirement to take out reinsurance. [½]

The reinsurance cost may be favourable so it is cost effective for the insurer to cede part of its risk. [½]

Improved solvency should improve the insurer's credit rating and so increase access to future financing opportunities (or financing on better terms). [½]

[Maximum 12]

This question was largely bookwork based and most candidates scored very well. The better candidates tailored their solution to consider the reinsurance requirements for the insurer in question, which was small and had a low solvency level.

It was pleasing to see that many candidates set out their answers using subheadings.

- Q3** (i) Embedded value can be calculated as the sum of:
- the present value of future shareholder profits [½]
  - in respect of the existing business of a company, [½]
  - The shareholder-owned share [½]
  - of net assets [½]
  - where net assets are defined as the excess of assets held over those required to meet liabilities. [½]
- These assets may be valued at market value [½]

or may be discounted to reflect “lock-in”, [½]  
 for example, if they are required to be retained within the fund to cover  
 solvency capital requirements. [½]

The process of determining this amount is similar to performing a profit test, [½]  
 bearing in mind that some elements will not be applicable (e.g. new business  
 expenses). [½]

The calculation may differ for different types of business for example: [½]  
 Conventional without profits business: the present value of future premiums [½]  
 plus investment income [½]  
 less claims and expenses, [½]  
 plus the release of supervisory reserves. [½]

Unit-linked business: the present value of future charges (including surrender  
 penalties) [½]  
 less expenses and benefits in excess of the unit fund, [½]  
 plus investment income earned on [½]  
 and the release of any non-unit reserves. [½]

For without profits business, embedded value is effectively the release of any  
 margins within the supervisory reserves relative to the assumptions used  
 within the embedded value calculation. [½]

It is important that the reserves used in the determination of net assets are  
 consistent with those used in the determination of the present value of future  
 profits. [½]

Tax is allowed for within the calculation as appropriate. [½]

[Maximum 6]

(ii) (a) **PMI**

Cancer might be excluded under the policy as it is a chronic rather than  
 an acute condition [1]

If cancer is not excluded then assume that PMI policy benefits would  
 include the new treatment. [½]

Frequency/number of claims: If the announcement of the cure does  
 lead to more people being worried about their health and seeking  
 medical consultations then the diagnosis rate will increase [½]

or a national screening program may be introduced [½]  
 and there will be more claims due to lung cancer. [½]

Not only will there be more claims relating to lung cancer treatment,  
 but the cost of these claims will be higher as the new treatment is more  
 expensive [½]

and the duration of the treatment may be longer [½]

With more people seeking medical consultations then, even if they are  
 not diagnosed with lung cancer, then they could be diagnosed with



other conditions which could lead to claims for other types of cancer or other medical conditions. [½]

Overall, the present value of claims increases [1]

If the policies cover the cost of the test, this would increase the claims cost further. [½]

The increased survival rates for individuals who would have previously died from lung cancer may increase the future premiums/charges received by the insurer offsetting some of the additional claim costs. [½]

As the treatment will be available in 6 months then it does impact the existing business, even if this is only 12 month contracts (as is typical for PMI business). [½]

Supervisory reserves increase [½]

relating to lung cancer treatments is now higher than when the premiums were set. [½]

This leads to an instantaneous decrease in net assets at the valuation date and a reduction in the EV. [½]

As the future risk period progresses, future releases of reserves could be bigger or smaller than currently. [½]

To calculate an appropriate adjustment to the reserves, estimate how many more claims and additional costs of these claims will be made. [½]

E.g. Analyse the percentage of insured members who smoke if this can be deduced from available insured member information. [½]

The additional cost per case will be the difference between the cost of the new treatment and the cost of the existing treatments. [½]

Policies are typically annually reviewable so the premium could be reviewed at the next renewal date to reflect the higher expected future claims. [½]

However, the EV would typically not include the value related to future renewing business which had not formally renewed (i.e. not included if no signed contract at the EV valuation date). [½]

The EV (through the PVFP element) has less significance for short-term business such as PMI. [½]

[Maximum 6]

(ii) (b) **Critical Illness**

If lung cancer is not a large issue for the target market the insurer has sold to the impact may not be significant [½]

e.g. predominantly wealthy non-smokers [½]

*Stand alone critical illness business*

CI business could be unit-linked or conventional without profits business in which case the EV calculation will be different. [½]

For existing business, the policy terms and conditions would typically include lung cancer on the list of critical illnesses. [½]

The policy terms and conditions could not be changed immediately following this news i.e. lung cancer would have to be kept as a critical illness to cover the people who are diagnosed too late for the cure to work. [½]

The rate of diagnosis would increase as more people who are worried they may have the disease will seek a medical consultation knowing that there is now a cure. [½]

Therefore it would be expected that the number of critical illness diagnoses due to lung cancer would increase by a small amount [½] and for these diagnoses to occur earlier. [½]

Specifically for standalone CI business, the earlier diagnoses will mean that some cases of lung cancer are detected before the individual dies. [½]

Before the cure was available, more insured members would have died during the survival period and in these cases the standalone CI policies would not have paid a claim. [½]

Therefore more claims occur [½] and claims occur earlier. [½]

For tiered benefit CI incidence of lung cancer may not reach the same levels of severity as previously. [½]

Reserves must be increased instantaneously to reflect the higher number of claims due to lung cancer [½] and the shorter discounting period for these expected claims (assuming positive discount rates). [½]

There will be an instantaneous reduction in net assets and therefore EV reduction. [½]

Also, with more and earlier diagnoses (and therefore claims) there will be a shorter future period in which to receive policy charges. [½]

Therefore the PVFP of this CI business will reduce. Therefore a further reduction to EV. [½]

#### *Accelerated critical illness business*

Another impact of the introduction of the cure would be that there would be fewer insured members dying from lung cancer, i.e. overall mortality rates would be lower. [½]

Therefore there would be fewer death claims due to lung cancer within the portfolio of accelerated CI business. [½]

However, there would be claims for the diagnosis of lung cancer instead of the death due to lung cancer. Therefore the claim rates for the accelerated CI portfolio would not be expected to change. [½]

Although there will be a change in the timing of claims. [½]

The initial policy underwriting may have identified smoker status and so may have applied a loading for smokers. [½]

Even so, due to the diagnoses now expected earlier there would still be a negative impact on the EV for these underwritten policies, despite the initial premium loading. [½]

Once the cure is available then lung cancer could potentially be removed from the list of critical illnesses for policies with reviewable terms and conditions. [½]

However, even with a cure, there could still be a need for ongoing treatment over a prolonged period of time, which could be costly and still necessitate the need for critical illness insurance for this condition. [½]

If lung cancer is removed from the list of critical illnesses then there will be other illnesses that will be occurring instead. [½]

I.e. Removing one critical illness will extend the expected time until a claim is made, but not necessarily significantly. [½]

In this scenario, the EV may increase, but not necessarily significantly. [½]

Also, removing an illness from the list of critical illnesses may be commercially unacceptable and impact policyholders' Reasonable Expectations, [½]

unless it was accompanied by an equivalent benefit replacement or premium reduction. [½]

In this case, the net impact would be neutral on the EV. [½]

[Maximum 6]

(ii) (c) **Income Protection**

If the new cure is widely-publicized then it would lead to more people seeking diagnoses. [½]

This would lead to more claims and earlier claims [½]

This would mean that claim periods commence earlier than currently. [½]

For cases that previously would have resulted in death of the insured member, following the introduction of the cure, the claim periods due to lung cancer could become longer compared to cases in the past where diagnoses were made late and there was only a short claim period before death [½]

i.e. the new treatment prolongs life even for late diagnoses, even if it does not cure. [½]

For cases that result in the return to full health of the insured member, claim periods due to lung cancer would become shorter [½]

if the new treatment works more quickly than previous treatments. [½]

The change in the length of the claim period depends upon whether the new cure means that patients return to the healthy state quicker than with previous treatments, [½]

or quicker than the time to death. [½]

The impact will also depend on the length of the deferred period compared to the length of treatment time for the new cure. [½]

e.g. for cases of lung cancer diagnosed early and a full recovery is made within the deferred period, claims will not rise. [½]

It is not stated how long the new treatment takes. [½]

Even with a cure, there may still be a period where the person is unable to work, either due to the symptoms of lung cancer; the need to spend time undergoing treatments; [½]

or the side-effects of the treatments. [½]

As such, income protection insurance could not ignore this condition entirely. [½]

The increased survival rates for individuals who would have previously died from lung cancer may increase the future premiums/charges received by the insurer offsetting some of the additional claim costs. [½]

So the quantifiable impacts on the EV would be:

Earlier claim inceptions due to lung cancer or conditions diagnosed instead of lung cancer: [½]

Increases reserves, reduces net assets [½]

Reduces future period of receiving policy fees, reduces PVFP and reduces EV [½]

More claim inceptions due to lung cancer or conditions diagnosed instead of lung cancer: [½]

Increases reserves, reduces net assets [½]

Reduces future period of receiving policy fees, reduces PVFP and reduces EV [½]

It is not clear whether claim periods would be longer or shorter: [½]

There would probably be more claim terminations due to lung cancer claimants returning to full health, but depends upon the diagnosis/survival ratio. [½]

There would be fewer claim terminations due to lung cancer claimants dying, but depends upon the diagnosis/survival ratio. [½]

If claim periods increase or reduce, the EV will increase or reduce [½]

[Maximum 6]

[Total 24]

Part (i) which was bookwork, was generally well answered although not all candidates mentioned that it was the shareholders share of profits and net assets that are used to calculate embedded value or described how embedded value might be calculated for different types of insurance business.

In part (ii) many candidates did not apply, in enough depth, the principles to the specific products given the cure. For example, few candidates noted that there would be little change to claim rates for accelerated critical illness. The fact that the treatment is more expensive than existing treatments would not directly affect claims amounts under either CI or IP. However, for IP there might be an indirect effect depending on whether people with lung cancer could afford the treatment, which would then impact the length of time they spent off work before returning, or dying.

Overall, only the better candidates displayed a good knowledge of calculating embedded value for short term products such as private medical insurance.

- Q4** (i) The State may be the sole provider of healthcare from inception to recovery, [½]  
or it may only pay fully for healthcare in cases of financial hardship. [½]  
The State might carry out an education program on the types of health care provisions available [½]  
or invest in screening programs or other types of prevention. [½]
- Direct provision** [½]  
The State may provide its own medical establishments that perform the necessary treatments. [½]  
Some of these costs may be charged subsequently to the patient. [½]  
Alternatively, the commercial healthcare system may provide the services and the government may reimburse the expenditure, [½]  
either partially or fully. [½]  
or the state may subsidise health care providers [½]  
or encourage private provision through providing tax relief on premiums or benefits [½]
- Lump sum cash payment** [½]  
Other methods of illness subsidy arise with the lump sum provision of cash in the event of health breakdown or other medical need. [½]  
This would be deemed appropriate if the onset of disability called for capital expenditure [½]  
(e.g. to redesign a house in the light of restricted mobility or to pay for a specially adapted car). [½]
- Regular income** [½]  
The State may also recognise the need to provide an income for as long as disability continues, where the disabled person is unable to work. [½]  
As with commercial insurance, this may be subject to periodic reassessments to ensure continuing disability. [½]
- The amount of State benefit to be paid may be designed with a number of views in mind: [½]  
a salary-related benefit to “reward” those who have contributed more through taxation and to reflect their likely higher financial responsibilities [½]  
a flat benefit to provide an incentive to return to work, to minimise the cost on the State and to encourage self-provision through insurance. [½]  
Income benefits often increase in payment in line with some form of consumer price index. [½]

**Differentiation** [½]

The benefit level (either expressed as a proportion of earnings if salary-related, or amount of flat benefit) may depend on the severity of the disability. [½]

However, the State may also see itself as having different responsibilities towards different members of the population. [½]

For example, its willingness to pay a benefit may differ if the patient is unemployed, in full-time education, retired, a widow/widower or a war veteran. [½]

or means test benefits and only provide support to the less well off in the population. [½]

The aim is to try to align benefit with need and not just degree of disability. [½]

[Maximum 5]

- (ii) Expatriates are likely to want the highest quality care [½]  
 (e.g. private rooms in hospitals at all times, option to choose their preferred doctor) [½]  
 and this would be more costly if provided. [½]  
 Some expatriates may be able and may choose to return to their home countries for treatment for some conditions [½]  
 and so would not use the healthcare system of the country [½]  
 This demographic group includes relatively high probability of pregnancy and maternity-related health and care needs. [½]  
 May also need cover for spouse and/or children [½]  
 May want repatriation to their country of origin if they experience a very serious accident or illness. [½]  
 May be entitled to support from the state, or their home country, or they may have private arrangements. [½]  
 Require routine health services such as dental and optical checkups. [½]  
 As they are likely to move back to their country of origin in their 40s / 50s, their long-term health product needs are likely to have shorter-than-standard terms to fit in with this [½]  
 Similarly, presumably their PMI needs will only extend until they return home, renewals after certain ages are unlikely [½]  
 They may be less likely to have mortgages / loans if their stay in the country is only temporary, so less need for IP / CI to make interest / capital payments (or other appropriate comment). [½]  
 They may have a significant need to return to work quickly after an illness. [½]  
 They may need / want flexibility over the time / location of treatments. [½]

**PMI** [½]

May require in addition to services covered by the state. [½]

e.g. physiotherapy (*or other suitable example*) [½]

Dental and optical cover [½]

Health cash plans [½]

**CI** [½]

Would meet a need for people with financial dependents. [½]

Would need appropriate coverage e.g. malaria, yellow fever if prevalent in the country. [½]

There may be a need for “children’s benefits” as many 20-40 year olds are likely to have children. [½]

May need cover to be portable [½]

e.g. to provide cover if return home for diseases which might not be covered in CI policies in home country [½]

**IP** [½]

Would be needed to cover income during periods of ill-health and inability to work. [½]

However, the state may provide this. [½]

or their employer may provide this. [½]

The above may be individual or group policies. [½]

**LTC** [½]

Very unlikely to be required by this demographic group. [½]

[Maximum 5]

(iii) Expatriates are generally in very good health as they are fit enough to have moved to work abroad. [½]

Small probability of accidents requiring emergency treatment. [½]

Small probability of onset of any illnesses requiring treatment. [½]

Very few people in this demographic group expected to have chronic conditions. [½]

Very few people in this demographic group expected to be diagnosed with critical illnesses. [½]

While the expats have lower incidences of accidents at work, office workers may be more prone to mental illnesses / issues, such as stress. [½]

Expect less health and care needs for the expatriates than the corresponding age group of the domestic population as the expatriates are generally healthier. [½]

For example, the domestic population would include members with chronic conditions and long term disabilities. [½]

The native population includes all ages and socioeconomic groups [½]

so would require a much wider range of health and care needs. [½]  
In particular, the native population includes members above retirement age and this group would have specific health and care needs such as Long Term Care. [½]  
Expatriates are likely to be better off than the general population and hence able to afford higher levels of cover than the general population. [½]  
If expatriates do not have access to all the state/employer benefits that the local population get, expatriates may have different levels of cover [½]  
e.g. they may want shorter deferred periods for income protection business than the local population. [½]  
The expats may have a lack of (extended) family support, so a greater need for replacement income / fast return to work / returning home on diagnosis of a condition [½]  
There may be different underlying healthcare needs that relate to lifestyle [½]  
Similarly, childhood exposure to various factors might increase or decrease immunity to certain diseases in adulthood, so the expats might be more, or less, exposed to certain risks. [½]

[Maximum 3]

- (iv) Benefits to specifically meet expatriates PMI needs could include:
- Top-up cover to fill any gaps between the health provision in the country and the provision in their home country [½]
  - hospital cash plans [½]
  - supplementary cover: e.g. private rooms, choice of doctors, therapeutic treatments, alternative treatments. [½]
  - repatriation in case of medical emergencies, long periods of recuperation/recovery. [½]
  - or death [½]
  - medical professionals with specific language skills. [½]
  - flexibility of location for treatment [½]
  - healthcare in home country in special circumstances. [½]
  - practical advice on where to obtain medical services and how to deal with providers [½]
  - such as paying for treatment and claiming reimbursements, [½]
  - potentially in different currencies. [½]
  - flexibility to choose from a range of different benefit levels [½]
  - flexibility to choose from a range of deductible levels to meet their personal affordability criteria [½]
  - not forced to pay for cover which would be unnecessary for expatriates, such as any long term benefits... [½]
  - e.g. dependents cover if they did not have any dependents [½]
  - Could mention a cash benefit if they use the State healthcare system (or the State healthcare system in their home country). [½]
  - Payment of costs for family members to be transported to / accommodated in the country following serious operations. [½]
  - Inclusion of vaccinations for local illnesses. [½]
  - If language is an issue, as well as medical professionals with specific language skills, information provided in their own language. [½]



Also, in this case indemnity benefits with few exclusions so that they know what they are covered for. [½]  
or additional exclusions, e.g. work-related injuries or if they moved back to their home country. [½]

Individual plans for individuals – for self-employed or for employees of companies which do not offer sufficient health and care cover. [½]  
These would typically include option to include close family members (spouse and children) on the same policy. [½]  
Consider whether any renewability guarantees should be offered [½]

Group plans for employers of expatriates. For multinational companies, the policyholder could be either the part of the company in the country of origin of the individual employees or the destination country. [½]  
Group plans could include continuation options so that the employee can get an individual policy on standard rates if he/she leaves the group [½]  
either to return to the home country or to a different employer who offers insufficient health cover. [½]

[Maximum 5]

[Total 18]

A number of candidates focussed on bookwork in this question with little application to the specific situation and potential needs of expatriates and hence failed to make sufficient points to score well.

In part (i) most candidates discussed the direct provision of health services and the encouragement of private provision through tax breaks on premiums or the subsidisation of health care providers but relatively few candidates mentioned any other possible methods.

Part (ii) was generally well answered.

Part (iii) was less well answered, with relatively few candidates discussing the different needs between the local and expatriate population in any real detail; for instance, that they are younger and may have little or no family support, and to be wealthier and healthier than the local population.

Part (iv) was generally reasonably answered, although only the better candidates mentioned such features as providing medical staff with language skills, the flexibility to choose different benefit levels or deductibles, the potential need for family cover or cover for the costs of flying in family members or of repatriation. Very few candidates discussed group plans.

**Q5 (i) Current protection**

The protection needs may depend on the level of savings of the family. [½]  
 However, due to the fact they are young and have a mortgage, they are unlikely to have much savings. [½]  
 The current level of cover does not provide adequate protection. [½]  
 It does not provide sufficient money to cover the mortgage in case of death of the father. [½]  
 There is no financial protection against the risk that the mother dies. [½]  
 They have no financial protection against either the mother or father suffering from a critical illness which would stop them from working. [½]  
 They do not have any policy that provides income in case of illness or costs of medical treatments/care [½]

**Income**

They have a need to:  
 Protect their earnings in case of incapacity of one of both adults. [½]  
 e.g. day-to-day living costs [½]  
 Protect their property in case of inability to pay the mortgage payments or pay off the mortgage due to illness [½]  
 or death [½]  
 Provide income to pay life insurance premiums (if employer does not pay these or only partially meets them). [½]  
 Provide additional money to deal with costs resulting from any serious illnesses of one or both adults [½]  
 such as home improvements [½]  
 or mobility devices [½]  
 or additional physiotherapy. [½]  
 Provide additional money to deal with costs resulting from serious illnesses of the children. [½]

**Health**

They have a need to:  
 Protect their health [½]  
 Indemnify the costs of healthcare. [½]  
 Provide care for children (and possibly parents). [½]  
 Flexibility to change cover e.g. if circumstances change. [½]  
 May need dental/optical care for themselves and/or their children. [½]  
 Their needs will also depend on the benefits provided by the state or their employer [½]  
 e.g. statutory sick pay. [½]

[Maximum 6]

**(ii) Income Protection [½]**

Pays monthly a sum insured after the deferred period passed. [½]

Replaces the lost earnings due to inability to work. [½]  
 Allows to continue to pay the bills and mortgage. [½]  
 May want benefits to be index-linked. [½]

**Accelerated/Stand Alone Critical Illness** [½]

Pays a lump sum on diagnosis of a critical illness (or earlier death). [½]  
 Could provide additional cover for children, in case of any critical illnesses. [½]  
 This money could be used to deal with financial consequences from falling ill: [½]  
 Allow to pay off a part / full mortgage. [½]  
 Provide additional money to cover the costs necessary to any improvements of the property / car /etc. [½]  
 Husband may need stand alone CI. [½]  
 His spouse may need accelerated CI. [½]  
 May want GIO to increase the sum insured if a life-event causes circumstances to change. [½]

**PMI** [½]

The cover indemnifies the costs of medical treatments for covered treatments / diseases. [½]  
 Provides access to necessary treatments. [½]  
 Allows quicker recovery by providing access to better healthcare. [½]  
 Avoids waiting for treatment provided by the state. [½]  
 It may provide cover for treatments that are not provided by the state. [½]  
 May also provide access to better medical facilities than provided by the State [½]  
 or provide a choice of doctors, hospitals etc. [½]  
 In all cases, if low levels of savings/cash, may prefer products with guaranteed premium rates. [½]

[Maximum 6]

[Total 12]

This question was generally very well answered with many candidates providing a good range of relevant points.

- Q6** (i) This is a form of disability cover which is often included within critical illness products. [½]  
 For CI payout is restricted to permanent disability. [½]  
 “permanent” has to be defined carefully and is usually taken to be “beyond the hope of recovery in your lifetime”. [½]  
 “Total” in practice means the failure of ability to perform a major or substantial part of the job or function. [½]

Hence, even if a disability is severe in the short term, if a recovery is eventually expected to occur, the benefit will not be paid. [½]

[Maximum 2]

- (ii) The incidence of the various potential TPDs needs to be carefully investigated and factored into the price of this product. [½]

### **Claims and modelling risk**

The main risk for SACI relates to the type of claim, the claim inception rates and expenses. [½]

Medical developments could lead to the earlier conclusion that conditions are total and permanent, thus leading to earlier claims. [½]

There will be an increased requirement to model expected claims – numbers and sum assured. [½]

Sums assured are fixed for each policy but it is not known which policies will claim.

[½]

This leads to an increased modelling risk e.g. that the model representing the SACI with TPD claims does not sufficiently reflect the actual claim experience. [½]

There is increased parameter risk e.g. the assumptions made do not reflect the lives actually being covered. [½]

There is increased random fluctuation risk. [½]

The revised product will have higher claim rates. [½]

There may be a significant overlap since many CI conditions can lead to a valid TPD claim [½]

e.g. paralysis or dementia. [½]

However, the overlapping might not be as significant as anticipated (i.e. could be lower than expected). [½]

### **Lapses**

There is an increased risk of lapse and re-entry as existing SACI policyholders lapse and take out policies with the TPD rider [½]

particularly in the Broker sector where the enhanced policy is more likely to meet customer need. [½]

A greater number of early lapses (when asset share is negative) than expected will have an adverse impact. [½]

Lapses may also be selective [½]

and brokers carrying out regular client reviews will need to recommend the best cover. [½]

Also new fees/commission will be earned on the new sale. [½]

Increased commission and processing lapses will increase expenses. [½]

There is a greater risk that policyholders will be dissatisfied with their policy/question its value and lapse. [½]

### **Expenses**

There is a greater risk of mis-estimation of expenses, due to lack of experience with TPD [½]  
e.g. expenses relating to underwriting / claims management. [½]  
There may be greater risk of mis-estimation of future expense inflation, due to not having experience of TPD. [½]  
Short term expansion may lead to the risk of expenses being less controlled and hence increasing above the levels planned. [½]  
Higher claims, expenses etc. can lead to lower profits than expected. [1]

### **Data**

The company has not offered TPD before hence it has no data of its own. [½]  
TPD is a long term policy so it will take considerable time to build up sufficient and credible amounts of own data to use for pricing and reserving. [½]  
Hence there is a significant mis-pricing risk. [½]  
Data from consultants/reinsurers may be costly. [½]  
It will not reflect the insurers target market and will require adjustment which may be done incorrectly. [½]  
The insurer will need to ensure the data being provided by other sources is complete, accurate and consistent. [½]

### **Underwriting**

The importance of particular new underwriting may not be understood. [½]  
The underwriting department has not had experience in underwriting TPD so risk of not underwriting properly. [½]  
Increased volumes of business will make fraud difficult to spot. [½]  
There is a greater risk of non-disclosure. [½]

### **Claims management**

Risk of failure to manage claims properly due to inexperience, [½]  
giving rise to higher claims costs than anticipated. [½]

### **New business mix and volumes**

More complex product for customers and brokers to understand and sell. [½]  
Increased risk that the new business profile differs from that anticipated by mix of business, [½]  
size of contract and [½]  
number of policies sold. [½]  
Greater risk of over-estimation of the potential demand, due to lack of experience with TPD [½]  
or uncompetitive premiums [½]  
leading to being unable to recover development expenses and fixed costs [½]  
or under-estimation of the potential demand [½]  
which could cause a strain on the new administration processes [½]

or absorb too much capital [½]  
particularly since the sums assured are different from those planned. [½]  
Similarly, if premiums are competitive there is a risk of selling too much business. [½]  
Changes in the State benefits for TPD conditions could lead to unanticipated changes in demand for the product. [½]  
If more business is sold more staff will be required, leading to an increased risk that they cannot be adequately trained in time. [½]  
A change in the mix of business will affect profits if there are cross-subsidies in the pricing basis. [½]

### **Uncertainty**

Greater uncertainty will lead to the need for greater margins in the reserves [½]  
and in pricing for adverse expense experience. [½]  
The company will therefore have more cash to invest. [½]  
There is a greater risk of exposure to catastrophes. [½]  
There is a greater concentration risk e.g. geographical [½]  
or occupational. [½]  
There is a greater risk of adverse selection and moral hazard. [½]

### **Investment**

There may be a greater investment risk if required to hold higher reserves [½]  
and a greater risk of losses in the investment market. [½]  
There is a need to have more investment expertise either in house with recruitment costs, [½]  
or externally which introduces risks relating to custody of assets, adequate control and monitoring of a third party. [½]  
There will be an increase in claim payments leading to a need for liquidity which may not be met by current asset holdings. [½]

### **Mis-selling**

There will be more sales through the broker network, hence more risk that money is not passed on [½]  
and that the products are misrepresented. [½]

### **Reinsurance**

More reinsurance cover will be required. [½]  
Cover for the increased risk may not be available at an acceptable cost. [½]  
This would also increase counterparty risk. [½]

### **Political/regulatory**

There is a greater risk of adverse political actions [½]  
or regulatory actions [½]

### **Operational**

|                                                                                                                                 |     |
|---------------------------------------------------------------------------------------------------------------------------------|-----|
| Less experienced staff leads to a greater risk of errors, or errors not being detected.                                         | [½] |
| There will be increased risks from producing new literature                                                                     | [½] |
| e.g. around distributing, replacing and updating literature.                                                                    | [½] |
| Terms and conditions will be extended leading to greater risks of misunderstandings and disagreement.                           | [½] |
| TPD can have huge scope for misunderstanding and disagreement.                                                                  | [1] |
| Hence there is potential for bad publicity due to refused claims.                                                               | [½] |
| This may also lead to possible legal challenge                                                                                  | [½] |
| and unexpected claim costs                                                                                                      | [½] |
| and possible regulatory action.                                                                                                 | [½] |
| There are greater risks associated with outsourcing if increased volumes mean this is required.                                 | [½] |
| Large volumes lead to large numbers of staff and increased cost.                                                                | [½] |
| Systems will need to be expanded to cope with the increased policy data and build up and retain claim data for future analysis. | [½] |
| There is a risk of inappropriate management information                                                                         | [½] |
| leading to inappropriate management action.                                                                                     | [½] |

### **Capital requirements**

|                                                                                                                  |     |
|------------------------------------------------------------------------------------------------------------------|-----|
| There will be increased reporting/reserving requirements which may lead to higher overall solvency requirements. | [½] |
| Increased claims volatility will also lead to higher capital requirements                                        | [½] |
| and there is greater potential for fines due to accidental non compliance.                                       | [½] |

[Maximum 21]

[Total 23]

Part (i) was generally reasonably answered.

Part (ii) was also generally well answered, with many candidates providing a wide range of points relevant to the scenario described. Relatively few candidates discussed claims and modelling or underwriting risks or uncertainty in any detail.

Again, it was pleasing to see that many candidates provided their answers under subheadings, making them easier to follow and mark and also showing how they had applied their knowledge to the specific scenario described.

## **END OF EXAMINERS' REPORT**