INSTITUTE AND FACULTY OF ACTUARIES

EXAMINERS' REPORT

April 2019 Examinations

Subject SA1 – Health and Care Specialist Applications

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 2019

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

1. The aim of the Health and Care Specialist Applications subject is to instil in the successful candidates the ability to apply knowledge of the health and care environment and the principles of actuarial practice to the provision of health and care.

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 use subheadings when answering long part questions.

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

This paper was more challenging than some SA1 papers in recent diets; this is reflected in the lower pass mark.

Well-prepared candidates scored well across most of the paper. Questions that required an element of analysis or application of knowledge to a particular situation were less well answered than those that were mainly knowledge based.

It is encouraging to see many candidates using headings in their answers to the longer part questions.

The comments that follow the questions concentrate on areas where the candidates could have improved their performance.

Pass Mark

The Pass Mark for this exam was 55

Solutions Subject SA1

Q1

(i)

Health tourists are likely to be seeking primary, secondary or tertiary care in Country A [½]
Covering acute and chronic conditions, pregnancy [½]
And GP consultations for known health problems. [½]
The option of obtaining drugs on prescription if this is cheaper than their market price [1]
And other drugs such as chemotherapy. [½]
Maternity services [½]
Neo natal care [½]
Admission to hospital if required, leading to [½]
Costs of the accommodation in hospital e.g. bed, food [½]
And costs of the treatment in hospital [½]
e.g. Nursing care. [½]
Diagnostic procedures [½]
e.g. Radiology, scanning and pathology. [½]
Surgeons' fees and the cost of operating theatre [½]
Anaesthetists' fees [½]
Surgical dressings and drugs [½]
Specialist consultations [½]
Physiotherapy [½]
Any of these may continue during recuperation. [½]
Accommodation for parents to stay in or close to the hospital if their child is being treated. [½]
Recuperative care after any operation or other treatment, either in the hospital or at a nursing/convalescent home. [1]
Long term care following an operation or other treatment [½]
Rehabilitation treatment [½]
Dental treatment [½]
Optical treatment [½]
Access to cosmetic surgery/treatments [½]
Access to alternative therapies [½]

Although unlikely to be the reason for visiting Country A, health tourists may also use
Accident and emergency treatment at a hospital [½]
Transport by ambulance in the event of accident or emergency [½]
GP, walk-in centre or urgent care consultations for any health problems which start during their stay in Country A [½]

[Max 10]

(ii)

Health tourists will not pay tax in Country A [½]
And so do not pay towards the cost of their healthcare. [½]
The fact that they receive the same treatment as those who pay via the tax system may be viewed as unfair by tax paying residents. [½]
May lead to increases in the rate of taxation [½]
Or increases in national debt [½]
Or the State may need to divert funds from elsewhere (e.g. education, defence) in order to continue to provide free healthcare. [½]

If the level of health tourism continues to increase, this may lead to a strain on Country A resources. [½]
Country A may not have enough hospitals [½]
And may be unable to recruit enough medical staff. [½]
May lead to need to introduce incentives to attract more people into the healthcare profession [½]
Or recruit from other countries [½]
Leading to increases in wages. [½]
May need to provide more training facilities [½]
And potentially the need to build more hospitals. [½]
Hospital building is costly. [½]
There will be a significant lag before new hospitals are available. [½]
Increased risk that they are no longer required once they have been built. [½]
The impact of demand from health tourists may not be equally distributed in terms of: [½]
Location e,g, one or two regions may be most heavily affected which may make planning how to respond to this demand difficult [½]
Timing e.g. there may be seasonal trends to health tourism (perhaps coinciding with holiday periods in overseas countries) [½]
Type of treatment (e.g. acute conditions may be more likely to be a source of health tourism as they can be resolved). [½]
These are likely to be expensive (e.g. open heart surgery) [½]
And time consuming (e.g. stroke) [½]
And require long recuperation. [½]
This may limit the ability of residents of Country A to access these treatments. [½]
The strain on the healthcare system from health tourists could lead to longer waiting times for residents which is likely to be unpopular. [½]
There may be a reduction in the quality of healthcare for its citizens. [½]
This may have political consequences e.g. protests or a change of government. [½]
The future healthcare requirements for Country A will be difficult to plan for: [½]
Demand for Country A's healthcare will depend not on known factors such as the population of Country A and estimates of their future health need [½]
But on unknown and hugely variable factors such as changes in the number of Health tourists and changes their health needs [½]
Leading to an increased risk of there being over/under supply [½]

And using resources inefficiently for the residents of Country A. [½]
No one is turned away from a walk-in centre or an accident and emergency department if they need care. [½]
Citizens and visitors are not currently required to show the treatment provider that they have residency status, health travel insurance or the means to pay for their treatment before that treatment commences. [½]

There are no travel restrictions on expectant mothers who may need maternity services. [½]
Premature babies may have complications leading to long stays in specialist units. [½]

[Max 10]

(iii)

Cover for the costs of providing healthcare [½]
Including drugs at market values to non-citizens of Country A; [½]
For example, through a PMI type policy reimbursing the Country A government for these costs [½]
Or health cash plans providing some reimbursement of costs. [½]
Cost of repatriation to their home country for treatment, using a suitably staffed medical flight as soon as they are able to travel. [½]
Recuperative care after any operation or other treatment, either in the hospital or at a nursing/convalescent home until the visitor can be repatriated. [½]
Long-term care after any operation or other treatment. [½]

[Max 2]

(iv)

<u>Advantages of Option 1</u>

The government knows its default policy will meet its requirements for the level of cover; this would not necessarily be the case under Option 2. [½]
The government is more likely to be able to make commission, or more commission, on selling its preferred policy than under Option 2. [½]
The government can be certain everyone entering has cover which may not be the case under Option 2. [½]
Travellers are able to buy their own policy if they prefer, or can obtain it cheaper, they can have annual policies; [½]
And avoids charging everyone for cover they may already have. [½]
These are less likely to be a deterrent for travel to Country A of non-Health Tourists than Option 2. [½]
The extra staff and checks may be advantages from other angles e.g. counterterrorism. [½]
It does not impose potentially unpopular burdens on the carriers, which is likely to be the case under Option 2. [½]
Avoids having to ban non-compliant carriers or fine them or take legal action against them. [½]

Disadvantages of Option 1

Option 1 is potentially more complex and expensive for the government to administer [½]
As Country A has to employ sufficient qualified personnel to check visitors' health insurance cover at each point of entry to carry out the checks [½]
And suitably qualified sales persons to sell cover, if necessary, at each point of entry. [½]
There may be disputes over what 'adequate cover' is. [½]
Option 1 is very difficult to underwrite on the spot. [½]
Potentially more likely to give rise to mis-selling issues as cover may need to be bought quickly at point of entry. [½]
Option 1 is likely to be more onerous than Option 2 for the individual in terms of needing to buy their own cover, potentially leading to fewer non-Health tourists. [½]
Country A will have to source a suitable health policy, which may be difficult (under Option 2 responsibility is passed over to the carriers). [½]
Persons will be able to travel without a policy and have to be deported if they won't purchase the state option [½]
Potentially leading to Country A's government being associated with turning away visitors which may put off non-Health tourists. [½]
Travellers can still fall ill without a policy e.g. at the airport if they have not bought one and are ill before they can be sold the default policy. [½]

[Max 4]

(v)

The product

The first consideration is who is the client under the default option, this is presumably the traveller not the government. [½]
Does the selling of this product fit into the insurers' current risk appetite? [½]
This product potentially has many of the features of a group scheme, with the government in the position of sponsor/"employer". [½]
However unlike an employer the government has not had any contact with the traveller or been involved in selecting them e.g. for employment. [½]
It may be possible to introduce a profit share however as the purpose of the initiative is for the government to pass on its costs and risks this is unlikely to be acceptable. [½]
The insurer needs to cover all of the medical expenses of a passenger who has not purchased their own cover before travelling. [½]
Uninsured travellers are likely to be less healthy than the other travellers otherwise they would purchase their own (cheaper) health cover. [½]
Cover will usually be for short periods, possibly just a few days. [½]
However, there may be issues in setting the terms for some policies e.g. when individuals do not know how long they will be staying in country A or stay longer than intended. [½]
May need to check the rules covering visitor stays in County A. [½]
What terms will the policies include [½]
e.g. Excesses/Coinsurance [½]
Deferred periods – for short periods after diagnosis before treatment occurs [½]

Exclusions [½]
Will documents be in Country A's language or will it be necessary to have them translated into many different languages. [½]
Cost of claim is potentially unlimited. [½]
For the first years' experience data will be sparse. [½]
How long will the premium(s) be fixed for. [½]
Renewal (of the government contract) can be based on actual experience. [½]
Market and claim numbers and amounts have the potential to change substantially over very short time periods. [½]
Potential to make significant losses before repricing can take place. [½]
Costs of development will be high. [½]
Likely to be a one off. [½]

Will the policy be sold as individual or will joint or family/group cover be available. [½]
Does being the default provider put the insurer in a better position to sell alternative policies to customers before they turn up uninsured at the entry point. [½]

<u>The policyholder</u>
Policyholders could reside in any country. [½]
They do not belong to particular occupation groups. [½]
They can have serious medical conditions. [½]

<u>Market / distribution</u>
The insurer would need to assess the potential size of the target market overall, [½]
This could be large if travellers are unaware of the change and need to purchase cover on entry, [½]
And the potential for future growth [½]
And their potential share of it, taking into account opportunities to sell the individual policies. [½]
Whether it would be possible to sell enhanced products. [½]
Assess whether sufficient volumes can be sold to recoup development costs. [½]
Will there be a need to undertake a marketing/advertising campaign or will they be allocated customers by the government, [½]
The insurer would need to decide if entry into this market fits with the company's brand/strategy. [½]
There may be increased brand awareness through being associated with these policies, [½]
Are there benefits to the insurer from having a monopoly on this market. [½]
Citizens of Country A are likely to see the policies as reducing their contribution to healthcare so positive brand impact. [½]
Citizens of other countries may react negatively towards companies involved in the scheme, this is a global company with a global reputation to consider. [½]
The insurer would need to consider how the product will be sold/distributed and other changes to the sales process e.g. commission/fees. [½]

The economic situation would be considered; there might be more demand in a strongly growing economy. [½]
Transport links to Country A need to be considered; there may be more demand when travel is easier or there are more flights/ferries. [½]
Consider whether other countries have plans to change their health provision, charging structure or to introduce compulsory healthcare insurance in their own country. [½]
The insurer may be keen to do more business with the travel industry. [½]
The locations of default policyholders may fit well with its global locations so it may have more relevant data e.g. on local illnesses and locally available treatments. [½]
It may already have products which only require small changes to make them suitable. [½]
It could provide increased risk diversification with benefits for overall capital requirements. [½]

<u>Underwriting / claims management</u>
The insurer will have to establish what information it will be able/allowed to collect on each life. [½]
What policy information can be obtained from the proposal form (if any). [½]
What claim information it will receive from the state provider. [½]
The insurer is likely to only be able to carry out limited underwriting at the point of sale. [½]
It will not be possible to carry out the initial or claim underwriting the company is used to[½]
It will not be possible to decline poor risks [½]
Or to have exclusion clauses, PECs etc. [½]
The purpose of the policy is to ensure the uninsurable have cover. [½]
Would need to establish if the same price must be offered to everyone, regardless of age, gender and health status. [½]
It is not possible to carry out claim underwriting. [½]
The state healthcare system will decide if treatment is necessary. [½]
And the state healthcare system will be able to determine the cost of treatments. [½]
Investigate whether there could be scope to provide cover in alternative establishments with whom the insurer can negotiate discounts. [½]

<u>Morbidity/Mortality</u>
The numbers of claims incepting would need to be estimated. [½]
Compared to standard policies there will be more claims. [½]
The company is global so it will have data on its insured population, split by the countries in which it operates but most of its new clients will not have had insurance before [½]
But this data is likely to be for claims incurred within the insureds own country. [½]
The data which is required will be for claims and treatments outside the insured's home country, which is likely to be scarce. [½]
The Country A government should be able to provide data on the number and costs of treatments it provided to citizens of other countries. [½]
It may be necessary to obtain additional external data. [½]

This needs to be adjusted to reflect the likely profile of its new clients [½]
And the types of the expected treatments. [½]
Trends and seasonality in experience would need to be considered. [½]
The insurer will need to consider if there is sufficient data to allow it to be subdivided by country of origin, type of health procedure etc [½]
And split by age, gender etc. [½]
As data is built up it can be used to improve the understanding of the claim experience and improve quotes and reserving. [½]
This is a new scheme to all insurers so there are no data for a credibility factor if it chooses a group option [½]

Claim costs

This is an indemnity product so likely claim costs also need to be estimated. [½]
Clear definitions of what will be covered under each policy will be needed. [½]
It will need to consider if any limits on total claim cost can be imposed. [½]
The insurer will need to determine the most likely treatments [½]
And the costs of having these treatments in Country A [½]
The insurer needs to know the anticipated future levels of charges by the hospitals, split by procedure [½]
The insurer will need to know the anticipated future levels of charges by repatriation airline for various levels of repatriation eg walking wounded, full isolation, [½]
There may be opportunities for preferred supplier discounts if the insurer can use its own hospitals or airlines. [½]
Medical inflation/advances will need to be allowed for; the rate will be determined in part, if not completely, by the Country A government. [½]
The costs of treating the young and old may be significant. [½]
The potential for anti-selection would be considered. [½]
This will depend on the availability and cost of the treatments in the home country. [½]
There will be a greater need to incorporate margins, to reflect approximations/unknowns. [½]

Expenses / new business

Costs of advertising, marketing and selling the product will be very different from its current products. [½]
These costs will depend on how the government implements its policy. [½]
Unlikely to have marketing costs. [½]
Sales costs could be lower e.g. if government paid agents sell the policies [½]
And carry out the policy and claim administration. [½]
Government may expect commission. [½]
Claim expenses may be lower if the insurer simply reimburses the government rather than multiple policyholders. [½]
Reimbursement may take the form of monthly payment to the travel company or the government. [½]

There may be increased costs due to having to audit the government's bills for cover. [½]
Costs of settling disputes may be significantly higher. [½]
The government may not permit its bills to be queried or declined. [½]
Costs of changing systems may be significant [½]
As will the costs of developing and pricing the product. [½]
The insurer will need to ensure that expense loadings will be sufficient to cover anticipated costs. [½]
Any specific one-off and additional costs (e.g. product development, changes to the systems, training) will need to be allowed for, as will annual administration costs, regulation costs etc. [½]
Legal costs e.g. of disputes with the government over who is liable, also need to be estimated. [½]
Assumptions about new business volumes will be needed for spreading fixed costs. [½]
The average premium size will need to be estimated, and assumptions made about the mix of lives e.g. by age and sex. [½]
Policies are short term and will not be renewed so the costs will need to be recouped in the lifetime of the policy. [½]

<u>State intervention</u>
Country A is heavily involved but tourists own governments may impose regulations e.g. TCF on the insurer. [½]
Risk that Country A increases the costs above those in the market to make "profits". [½]
The insurer would need to know whether the government would be offering incentives to travel companies and/or subsidies to insurance companies. [½]
Consider any reporting or reserving requirements. [½]
The insurer would also need to consider whether the state healthcare provision will be changed e.g. more treatments available to non-citizens of Country A. [½]
Will there be marketing to encourage citizens of other countries to travel to Country A for treatments (by the government or others). [½]
How long will they be preferred suppliers. [½]
There may be reputational risks for the insurer from potential mis-selling of the policies. [½]
The proposed change may not actually be implemented or may be reversed after a short period by a new government. [½]

<u>Profit</u>
The insurer will need to consider whether there is potential for sufficient profit according to the company's profit criteria / shareholder (if relevant) minimum profit or return on capital requirements. [½]
It will also need to consider the sensitivity of profit to key risks and variables including claims costs, expenses and new business volumes. [½]
There is significant scope for anti-selection e.g. people travel when they know they have cancer, or a risky pregnancy [½]

And moral hazard e.g. travel companies offer/market treatment flights to the sick having obtained a good premium based on past good experience. [½]
The insurer would need to define the products which it is offering very carefully. [½]
The insurer would need to ensure that terms and conditions can be developed which meet the government's requirements but also limit the risk to an acceptable level for the insurance company. [½]
There may be a currency advantage leading to profits being higher when converted to Country A's currency. [½]
There could be capital, regulatory and tax advantages. [½]
It could be beneficial to stop a competitor gaining market share. [½]
The reserves and hence cost of capital could be higher because of the uncertainties involved. [½]
The insurer will need to investigate the capital required and its cost to the insurer. [½]
There may be high capital requirements due to uncertainty of this niche market. [½]

Other
Significant new business levels may lead to unmanageable new business strain. [½]
The insurer will need to consider whether reinsurance will be available [½]
And on acceptable terms. [½]
The Government might offer to meet costs above a certain limit. [½]
How will this affect the insurers' current solvency positions. [½]
Business may be sold in many countries and languages. [½]
Premiums may be paid in local currency or other currencies [½]
And claims settled in Country A's currency [½]
Potentially giving rise to currency exchange risks. [½]
The premiums may be difficult to collect or there may be lags before they are received. [½]
There will be many different sources of business – airline, airport, ferry terminal, travel agents etc. [½]
System changes are likely to be required. [½]
The insurer would need to consider the availability of sufficient numbers of trained staff to cope with the expected volumes of new business [½]
And where they need to be located [½]
And their language skills [½]
And would need to ensure there are sufficient trained staff to deal with the significantly higher claims management burden. [½]
The insurer may be interested in getting experience of tendering [½]
The insurer may want to work more closely with the government [½]

[Max 25]

(vi)
More likely to be offered as group schemes to airlines, ferry companies. [½]
Will a flat premium be added to the cost of the travel ticket or will the levy be determined after some underwriting. [½]
Consider whether it is possible to have exclusions or refuse cover to some travellers. [½]

The insurer might target certain organisations to work with and so restrict or reduce the countries it is exposed to covering. [½]
Will the government allow travel providers to choose any insurer [½]
Or will you be the only provider. [½]
If not you will be competing to offer cover to the travel providers which may limit your scope to make profits [½]
And even just to avoid losses. [½]
The insurer will need to consider how business will be sold, there may be costs and commission to specialist brokers. [½]
The insurer will need to consider whether there will be any restrictions on travel e.g. travel companies setting age limits. [½]
Initial costs may be lower if the travel companies sell, issue and administers the policies. [½]
Ongoing administration expenses are likely to be higher as dealing with more parties. [½]
Language issues will be more important [½]
Also currency fluctuations. [½]
A potentially complex and expensive claim payment system may be required to ensure correct amounts of premium are being received, correct allowance is made for cancellations, the correct claims amount is paid back etc. [1]
There may be a higher risk of fraud or poor claims control with group arrangements. [½]
Will the insurer need to be registered in all of the locations. [½]
Reporting requirements likely to be more onerous, may have to report in many countries. [½]
The insurer is more likely to know return dates making the determination of period of cover easier. [½]

[Max 4]

[Total Max 55]

Part (i) was generally very well answered with candidates thinking about the health services that someone might travel to another country to access, and services that a health tourist might then use once in Country A.

In part (ii) most candidates made the points that the health tourists were unlikely to be contributing towards the cost of their health care whilst in Country A and that this might lead to tax increases in Country A and the likely strain on resources affecting the home population and possibly leading to political unrest. Fewer candidates discussed items such as the expenses of and time lag in building more hospitals and the possibility of demand changing in the meantime, that the impact of demand from health tourists might not be equally distributed in terms of location or timing, or the likely difficulties in planning future health requirements for Country A.

In part (iii) whilst most candidates mentioned a requirement for PMI type insurance only the better candidates also mentioned requiring the cost of repatriation to their home country for treatment to be covered or the costs of recuperative care or long-term care after any operation or other treatment, either in the hospital or at a nursing/convalescent home.

Part (iv) was generally reasonably answered although some candidates.

Part (v) was also reasonably answered with candidates providing a wide range of relevant points. Whilst many candidates discussed the product, the market and profitability fewer candidates considered the likely attributes of the typical policyholder, whether the policy would be sold as individual or whether group/family cover would be offered, claims management and factors affecting claims costs and the availability of data for pricing.

Part (vi) was not well answered. Few candidates discussed whether the insurer would be the only provider or not, who would sell, issue and administer the policies or that a complex and potentially expensive claims payment system might be required.

Q2

(i)

In order to provide an assurance opinion, the scope should cover:
A review of the methodology, approach and assumptions used for the calculation of the Technical Provisions against the relevant Solvency II requirements. [½]
The Best Estimate Liabilities (BEL) and Risk Margin (RM) will be assessed separately. [½]
For BEL, premium provisions and claims provisions will be assessed separately. [½]
A review of the methodology, approach and assumptions used for the calculation of the Solvency Capital Requirement against the relevant Solvency II requirements. [½]
Check the actual calculation results of the Best Estimate Liabilities against the health insurer's internal documentation and with the relevant Solvency II requirements. [½]
Check the determination of the discount rate used for the BEL calculations, [½]
In particular, that any matching adjustment or volatility adjustment was correct. [½]
Check the actual calculation results of the Risk Margin against the health insurer's internal documentation and with the relevant Solvency II requirements. [½]
This would include the methodology used for the run-off of the non-hedgeable risks. [½]
Check the calculation of the diversification benefit in the SCR calculation. [½]
Check the actual calculation results of the Solvency Capital Requirement against the health insurer's internal documentation and with the relevant Solvency II requirements. [½]
This would include the level of look-through on the assets under stress [½]
The loss absorbency of deferred tax (LADT) [½]
Treatment of pension scheme. [½]
The review will also cover the models used to carry out parts of the calculations. [½]
A review of the input data to ensure that they are complete, appropriate and accurate. [½]
A review of the governance and controls over the calculation processes. [½]
A review of the output data to ensure that they have been extracted correctly from the models. [½]
A review of the adequacy of the review and sign-off processes that the methodology, assumptions and final figures have gone through prior to the independent review. [½]

[Parts (i), (ii) and (iii) of this question were cross marked] **[Max 5]**

(ii)

Basis of preparation

TP methodology and approach paper	[½]
TP assumptions paper	[½]
Experience investigation reports	[½]
Back testing results	[½]
SCR methodology and approach paper	[½]
Expert Judgement log	[½]

Asset data

Look-through data for investment funds	[½]
Market value of assets	[½]
Credit rating of assets	[½]
Currency of assets	[½]
Bonds (coupon,	[½]
Equity	[½]
Property	[½]
Cash/Deposits	[½]
Derivatives	[½]
Pension scheme assets	[½]
Deferred tax assets	[½]

Liability data

Policy data	[½]
Claims data	[½]
Premium data	[½]
Pension scheme labilities	[½]
Reinsurance premium and claims data	[½]
Deferred tax liability	[½]

Results data

Results produced by the models	[½]
Broken down by SCR risk module	[½]
Analysis of change	[½]
Solvency II balance sheet	[½]
Quantitative reporting templates (QRTs)	[½]

Governance and controls

Processes documentation	[½]
Management sign-offs	[½]

Consultancy would want details of:

Expenses – data on overheads, directly attributable expenses and expense inflation [½]
Details of any contractual options and guarantees [½]
How cashflows were projected – e.g. was it on a policy by policy basis, or alternatively would want to understand if any approximations had been used. [½]
The consultancy may need information details of the policy terms that might affect policyholder actions [½]
Including options and guarantees [½]
Details of any transitional arrangements [½]
Details of any matching adjustment (unlikely for PMI)/volatility adjustment used
Details of treatment of options and guarantees [½]
Has the national regulator applied any capital 'add-on' in excess of the SCR calculated by the insurance company [½]
If so, details would be needed about why additional capital has been added on [½]

[Parts (i), (ii) and (iii) of this question were cross marked] **[Max 10]**

(iii)

(a) Input data
Spot check input data. [½]
Carry out a movement analysis to sense check the data. [½]
Reconcile market value of assets to audited accounts. [½]
Check credit rating of assets against independently sources such as Bloomberg or publicly available information where relevant [½]
Check currency of assets against independently sources such as Bloomberg or publicly available information where relevant. [½]
Reconcile policy data against policy admin system control reports. [½]
Reconcile premium amounts to audited accounts. [½]
Reconcile claims amounts to audited accounts. [½]
Check that all the parameters and assumptions have been entered correctly into the models [½]

[Max 3]

(b) Methodology, assumptions and calculation of the TP
Best Estimate Liability
Check that business have been segmented appropriately at the homogeneous risk group level, by prescribed Solvency II Lines of Business. [½]
They should then further segmented by currency. [½]
Check that the BEL is calculated gross of reinsurance. [½]
Review the appropriateness of the contract boundaries [½]
For PMI business these are likely to be up to the next policy renewal date. [½]

Check that the claims provision is the expected present value of all future claim

payments and expenses arising from claims events that have occurred before or at the valuation date. [½]
Reconcile the claims provision against the audited accounts by removing any prudence margins incorporated under the statutory basis. [½]
Would need to allow for guarantees and options. [½]
Check whether discounting has been allowed for, although due the short-term nature of the outstanding claims payment discounting may be ignored on materiality. [½]
Check that a cash flow approach has been adopted for the premium provision calculation. [½]
The premium provision should be the expected present value of all future cash flows relating to risk exposure after the valuation date. [½]
Check that the cash flow items such as premium, claims and expenses have been included in the projections. [½]
Check that the effect of lapses have been allowed for in the projections. [½]
All the assumptions should be best estimate and are consistent with the results of the experience investigations. [½]
Check the BEL calculations factor in all policyholder actions [½]
And management actions. [½]

<u>Reinsurance recoverable</u>
This is the expected present value of all future cash flows under reinsurance arrangements. [½]
Check that any expected losses due to the default of the reinsurance counterparty have been accounted for in the calculation. [½]
These need to must be split into two parts, one corresponding to the premium provision and the other corresponding to the claims provision. [½]
Check that reinsurance recoverables are included as an asset on the Solvency II balance sheet and that the BEL is shown gross of reinsurance on the liability side. [½]

<u>Risk Margin</u>
Check that the risk margin method is based on a 6% cost of capital approach applied to the present value of projected non-hedgeable risks. [½]
Non-hedgeable risks for a PMI insurer are likely to include the underwriting and operational risk modules. [½]
Check that these risk charges are being projected forwarded using appropriate risk drivers, such as premium volumes. [½]
Check that the correct risk free rates as prescribed by EIOPA have been incorporated correctly. [½]
Check any simplifications for the risk margin calculations [½]
For example, check drivers are appropriate. [½]

[Max 8]

(c) Methodology, assumptions and calculation of the SCR

Market risk

For bonds, check that they have been included in the interest risk and spread risk modules. [½]

Check that the credit spread for each bond has been derived in line with the relevant Solvency II requirements. [½]

Check that the up and down stresses for interest risk have been carried out correctly, and that the most onerous of the two has been selected for reporting. [½]

Check that consistent stresses have been applied on TP, although due to the short-tailed nature of PMI business interest rate risk is likely to be small. [½]

For spread risk, check that the calculation is based on the modified duration and the credit rating of each security. [½]

For equity risk, check that each holding has been categorised correctly into Type 1 or Type 2. [½]

Check that the correct symmetric adjustments as prescribed by Solvency II have been applied. [½]

Check that the correct risk charges as prescribed by Solvency II have been applied. [½]

For property risk, check that the correct property risk charge as prescribed by Solvency II has been applied. [½]

For spread risk, check that the calculation is based on the modified duration and the credit rating of each security. [½]

For currency risk, check that the correct property risk charge as prescribed by Solvency II has been applied to the net currency exposure. [½]

Check that the stresses are being applied based on the whether the upward or downward stress is biting for each currency. [½]

Check that the effects of any hedging/derivatives have been allowed for correctly. [½]

For concentration risk, check that exposures to each counterparty that is part of the same group are aggregated together. [½]

Check that a weighted average credit rating is used for the counterparty group and the correct concentration risk charge as prescribed by Solvency II has been applied. [½]

Check appropriate allowance made for any intangible assets. [½]

Counterparty Risk

For counterparty default risk, check that each holding has been categorised correctly into Type 1 or Type 2. [1]

And correct risk charge has been applied. [½]

Insurance risk

For non-life health risk for PMI business, check that it comprises underwriting risk (premium and reserve risk), [½]

Lapse risk [½]

And catastrophe risk. [½]

Check the correct stresses were used for disability/morbidity. [½]
Check that the premium risk charge is calculated from premium volume and the standard formula parameter for the standard deviation. [½]
Check that the reserve risk charge is calculated from reserve volume and the standard formula parameter for the standard deviation. [½]
Check that the correct lapse risk charge based on an immediate cancellation of a prescribed percentage of contracts has been applied. [½]
For catastrophe risk, check that the three types of catastrophic risks: mass accident risk, accident concentration risk and pandemic risk have been allowed for correctly. [½]

Operational risk

For operation risk, check that the formula applied is in line with the Solvency II requirements [½]
And is based on gross of reinsurance premiums. [½]

Other

Check that the individual stresses have been combined correctly to calculate the BSCR. [½]
Check the calculation of the loss absorbing capacity of deferred tax [½]
And ensure that this can be offset against deferred tax liabilities. [½]
Check that the prescribed correlation matrix has been correctly incorporated in the calculation. [½]

[Max 8]

(d) Governance and controls

Review the design of governance and controls over the experience investigations process. [½]
Review the design of governance and controls over the setting of best estimate assumptions, in particular how they relate to the results of the experience investigations. [½]
Review the design of governance and controls over the data input processes. [½]
Review the design of governance and controls over the model, in particular the access rights, version control and independent checking. [½]
Review the design of governance and controls over the results extraction process. [½]
Review the operating effectiveness by carrying out walkthrough of the processes with the relevant staff. [½]
Review the evidence of independent checks [½]
Such as management sign-offs [½]
And that they have been signed off by an appropriate person. [½]
Review the issues and errors log to ensure that all the material issues have been addressed, and follow up actions have been agreed to resolve any outstanding issues. [½]
Review the compliance with relevant professional and regulatory standards. [½]

[Cross mark with parts (i) and (ii) – also check total marks for each part]
[Max 3]

(iv)

The appropriateness of standard formula depends on whether any areas of the insurer's business materially deviates from the standard formula SCR assumptions. [½]
Does the insurer have the expertise to use an internal model [½]
Or the funds? [½]
For a health insurer, the standard formula should fit the risk charge of a number of areas of its business. [½]
The insurer's Own Risk and Solvency Assessment should allow it to demonstrate assessment of appropriateness. [½]
The assessment should be carried out for each risk module separately. [½]
The starting point is to consider the insurer's risk profile and materiality of each risk. [½]
For a health insurer writing PMI business, insurance risk is likely to be significant. [½]
Within insurance risk, lapse and catastrophe risks are not likely to be material due to the short term nature of the business. [½]
Premium and reserve risks are likely to be significant. [½]
Next step is to assess whether the risk profile of the business written by this insurer is likely to cause these risk to deviate materially from the standard formula SCR [1]
Past data should be used to assess the volatility of the premium and reserve risks. [½]
For market risk, the significance of each asset type should be considered separately. [½]
This would include:
Equity risk [½]
Interest risk [½]
Spread risk [½]
Currency risk [½]
Property risk [½]

[Maximum 1 mark awarded for two relevant risks]

The assessment should also take into consideration of the insurer's investment strategy/policy. [½]
A more aggressive approach in the investment strategy than the market norm on certain assets may cause the risk charge of the insurer concerned to deviate from the standard formula SCR assumptions. [½]

<u>Other risks to be assessed include</u>:
Counterparty default risk [½]
Concentration risk [½]
Operational risk [½]
Loss Absorbance of Deferred Tax [½]

[Maximum 1 mark awarded for two relevant risks]

In addition to the risk charges, the assessment should also cover the aggregation and diversification between risks. [½]

The risk correlations should reflect the insurer's risk profile and the dependencies between its risks. [½]

The insurer should also consider risks that are not covered by the standard formula. [1]

[Max 6]
[Total 45]

Q2 covered solvency II albeit asked in a different context than the usual questions on this topic. Parts (i) to (iii) were essentially asking about checking Solvency II results and so required the candidates to consider the data inputs and the high level calculations carried out for Solvency II and how these would be reviewed by an independent body. Only the better prepared candidates answered this question reasonably well.

Part (iv) required candidates to discuss the appropriateness of the Standard Formula approach for the SCR. This depends on whether areas of the insurer's business materially deviate from the standard formula SCR assumptions. The better candidates approached this question by discussing the insurer's likely risk profile and likely materiality of each risk. Few candidates mentioned that the assessment should include consideration of the insurer's investment strategy or that the insurer's Own Risk and Solvency Assessment might be used to demonstrate the appropriateness of the Standard Formula approach.

END OF EXAMINERS' REPORT