



**INFORMATION SYSTEMS
EXAMINATIONS BOARD**

**Practitioner Certificate
in
Software Test Management**

Syllabus

Version 2.0 – January 2008

Software Test Management

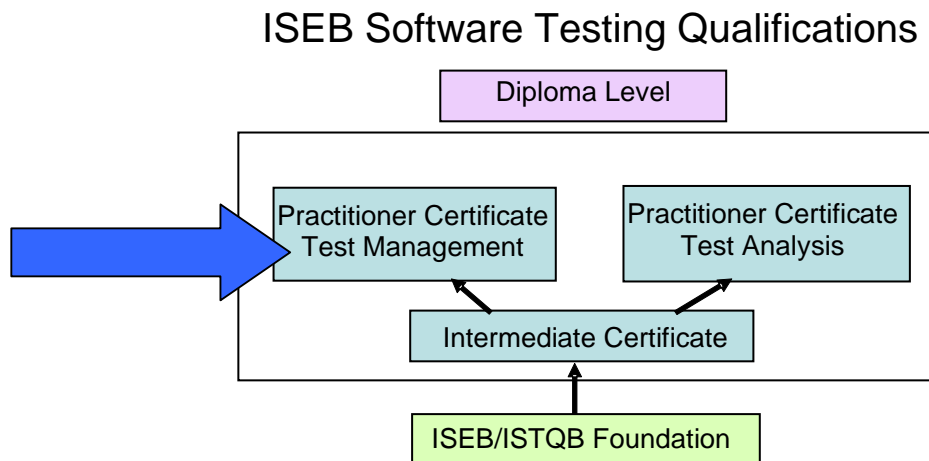
Background

This document is the syllabus for the ISEB Practitioner Certificate in Software Test Management, as administered by the British Computer Society's Information Systems Examination Board (ISEB).

Background information on the first level qualification, the Foundation Certificate, and the ISEB Intermediate Certificate, may be found at: www.iseb-exams.com/st.

A Testing Practitioner is anyone involved in Software Testing. This includes testers, test analysts, test engineers, test consultants, test managers, user acceptance testers, and software developers.

This syllabus extends the content of the ISEB/ISTQB Foundation Certificate syllabus in Software Testing, and builds directly on the topics in the areas of Test Management covered in the ISEB Intermediate Certificate in Software Testing syllabus.



Entry Criteria

The entry criteria for candidates wishing to take the ISEB Practitioner Certificate in Software Test Management examination are:

- hold the ISEB Intermediate Certificate in Software Testing

AND EITHER

- have at least 18 months experience in Software Testing

OR

- have completed an ISEB accredited training course for the Practitioner Certificate in Software Test Management

BUT preferably have all three of the above.

The Test Management Examination

The examination will consist of 6 optional questions. Candidates will be required to choose 4, with each question being worth 25% of the overall mark.

Candidates will be allowed 2 hours for the examination (with extra time allowed for those for whom English is not their first language).

To obtain a pass the candidate must achieve 60% or more, to achieve a distinction 80% or more.

The ISEB Practitioner Certificate in Test Management examination will be based on the syllabus in this document. Examination questions will be drawn from all topics in the syllabus, and coverage of any given topic can be expected to be in proportion to the amount of time allocated to that topic in the syllabus.

Answers to examination questions may require the use of material based on more than one section of this syllabus and where necessary supported by information from the required supporting syllabuses. All sections of the syllabus are examinable.

No section is intended to be independent, or will be examined independently - questions will typically ask candidates to demonstrate their understanding of the interactions between these subjects. A good standard of knowledge from the ISEB Intermediate Certificate in Software Testing syllabus will be required to succeed in this module.

Notice to Training Providers

Each major subject heading in the syllabus is assigned an allocated time. The purpose of this is to give both guidance on the relative proportion of time to be allocated to each section of an accredited course and an approximate minimum time for the teaching of each section. Course providers may spend more time than is indicated and candidates may spend more time again in reading and research.

The total time specified in this syllabus is 18 hours of lecture and practical work.

The course may be delivered as a series of modules with gaps between them, as long as it meets all other constraints. Courses do not have to follow the same order as the syllabus.

The syllabus contains references to established standards. The use of referenced standards in the preparation of training material is mandatory. Each standard used must be the version quoted in the current version of this syllabus.

Terminology Used

Terminology used in this document is from the current version of the ISTQB Glossary of Testing Terms or from IEEE Std. 829-1998, IEEE Std. 610-1990 or other referenced source as appropriate to the specialist topic. Standards override the glossary in cases of conflict. This syllabus may override both standards and glossary. Versions of standards and glossary change from time to time; the version current at the time of publication of this syllabus is the version referred to in this syllabus as the latest version.

Other Syllabuses

Any references to other ISEB syllabuses refer to the latest published version.

Bloom's Taxonomy

Learning objectives in this syllabus are given indicators from K1-K6. These are based on Bloom's taxonomy of knowledge in the cognitive domain (ref *Taxonomy of Educational Objectives, Handbook 1 – The Cognitive Domain*, Bloom et al., New York 1956), and can be broadly interpreted as follows: K1 – Recall; K2 – Comprehension; K3 – Application; K4 – Analysis; K5 – Synthesis; K6 – Evaluation. Bloom's taxonomy is explained in greater detail in Appendix A, where examples are given. All topics in this syllabus have learning objectives associated with them, each of which has an associated K level. The language used in this syllabus mirrors as closely as possible the language used in defining Bloom's taxonomy to provide candidates with consistent pointers to the expected level of knowledge and a consistent way of expressing that level in words.

Structure of this Document

This document is in three parts. This section deals with the use and purpose of the document itself, and the format of the related examination. The second section of the document contains the syllabus learning objectives with supporting content and commentary. The appendices provide supporting information, covering Bloom's taxonomy of educational objectives and the rules to which this syllabus was written.

This syllabus is structured into sections relating to major subject headings and numbered with a single digit section number. Each section is allocated a minimum contact time for presentation. Learning objectives are identified at the beginning of each section. The K level for each learning objective is identified at the lowest level of breakdown in the learning objectives list.

The breakdown of content matches the structure of the learning objectives, so that the material related to a given learning objective appears in a paragraph bearing the same numerical reference as that of the related learning objective. The content associated with each learning objective may include non-examinable explanatory commentary in italics as well as the examinable content associated with the learning objective.

Change History

Version 2.0 – January 2008	
1	Risk Management – timing changed from 5 hours to 4 hours. Learning objectives amended to reflect the reduced time available
2	Test Management Practice – timing changed from 8.5 hours to 8 hours. Learning objectives amended to reflect the reduced time available
5	People Skills – timing changed from 3 hours to 2 hours. Learning objectives amended to reflect the reduced time available
6	Test Process Improvement – timing changed from 1.5 hours to 1 hour. Learning objectives amended to reflect the reduced time available.

Syllabus for Practitioner Certificate in Test Management

Contents

1	Risk Management (4 hours)	6
1.1	Risk Identification (2 hours)	7
1.2	Risk Analysis (1 hour)	7
1.3	Risk Mitigation (1 hour)	8
2	Test Management Practice (8 hours)	9
2.1	Test Policy (0.5 hours)	11
2.2	Test Strategy (2 hours)	12
2.3	Test Plans (1.5 hours)	13
2.4	Test Reports (1 hour)	14
2.5	Test Estimation (1 hour)	14
2.6	Test Monitoring and Control (1 hour)	15
2.7	Incident Management (1 hour)	16
3	Test Technique, Test Type and Test Coverage Selection (1.5 hours)	17
4	Test Tool Selection & Implementation (1.5 hours)	21
5	People Skills (2 hours)	22
6	Test Process Improvement (1 hour)	25
	Appendix A: Levels of Knowledge	26
	Appendix B: Rules for ISEB SWT Practitioner Level Syllabuses	28
	Appendix C: Syllabus References	29

1 Risk Management (4 hours)

This section builds on section 3 of the Intermediate Certificate syllabus.

Learning Objectives

1.1 Risk Identification

- i. Describe challenges in the risk identification process (K2)
- ii. Identify project and product risks (K4)
- iii. Select suitable risk identification mechanisms (K6)

1.2 Risk Analysis

- i. Select suitable risk scoring methods (K4)
- ii. Identify challenges in the risk scoring process (K4)

1.3 Risk Mitigation

- i. Select the most appropriate method of risk mitigation (K4)

1 Risk Management (continued...)

1.1 Risk Identification (2 hours)

i. Describe challenges in the identification process.

Explain the use of workshops, expert interviews, independent assessments and checklists in the risk identification exercise.

For workshops identify typical stakeholders and the types of risks that they might highlight. For this syllabus, the stakeholder group will include project sponsors, project managers, marketing and sales teams, the IT team, the clients and the users.

Describe the challenges associated with holding risk workshops (including logistics, timings, willingness to participate, levels of domain knowledge) and the pitfalls of not including key stakeholders in the risk identification exercise.

Identify situations for which expert interviews can offer additional information on potential project and product risks.

Identify situations for which an independent assessment of potential product and project risks can be beneficial.

ii. Identify project and product risks.

Discuss the typical nature of product risks arising from different application domains, including:

- Web-based applications.
- Client-server applications.
- Large mainframe applications.
- PC-based applications.

Compare the project and product risks associated with projects for building new products with those where existing products are being enhanced.

iii. Select suitable risk identification mechanisms.

Analyse a scenario in order to provide substantiated arguments for or against each risk identification method given above.

- Analyse a scenario in order to identify project and product risks still outstanding at the end of a test project.

1.2 Risk Analysis (1 hour)

i. Select suitable risk scoring methods (K4)

For a given scenario, select the most suitable risk analysis method (i.e. quantitative or qualitative) and justify your choice;

ii. Explain the challenges of gaining consensus on risk scores in a given scenario and show how these may be overcome for each method.

1 Risk Management (continued...)

1.3 Risk Mitigation (1 hour)

i. Select the most appropriate method of risk mitigation (K4)

Recognise that not all risks need addressing. For those that require action, recognise that the risks may be shared with other stakeholders.

Explain the role of testing in risk mitigation, and what is meant by risk-based testing.

Recognise the need for continuous monitoring of risks throughout the testing project.

For a given scenario, select the most appropriate method(s) of risk mitigation.

2 Test Management Practice (8 hours)

This section builds on section 4 of the Intermediate Certificate syllabus.

The terms 'stakeholder' and 'stakeholder group' were introduced in the Intermediate Certificate syllabus. In this syllabus specific stakeholder groups will be considered. For the purposes of this syllabus the key characteristics of the groups considered will be as follows:

Business – the business stakeholder group is made up from stakeholders with an interest in the contribution of a given system or systems to the overall success of the business. This will include users of the system but also those who have been sponsored and funded the development and who will now be responsible for managing the business to which the system contributes. In this context 'business' is not limited to commercial activity but relates to the primary purpose of an enterprise and so would include 'businesses' such as a doctor's surgery, a school or a scientific laboratory. The primary focus of this group is successful operation of the enterprise's activities during and after any development activities associated with a project.

Project management – this is the group of people currently responsible for successful delivery the system or systems under development or of successfully completing an upgrade or other system maintenance task for which a project has been defined. The primary focus for this group is achieving successful delivery in line with whatever success criteria have been defined by the sponsors.

Development team – this is the group of people responsible for establishing requirements, specifying functional and non-functional aspects of a system, designing, coding, integrating and implementing the system, including integrating the system with other systems. Not all of the development activities will necessarily apply to every system. There may be overlap between this group and the 'business' group and/or between this group and the 'test team' group. The primary focus for this group is achieving delivery of the software component(s) of a system or systems.

Test team – this is the group of people responsible for planning, specifying and implementing the testing associated with a system or systems. This group may overlap with the 'development team' group and/or with the 'business group'. The primary focus for this group will be achieving whatever completion criteria have been set for the system and effective reporting of risk and other management information related to the effectiveness of the delivered system to other stakeholder groups.

Learning Objectives

2.1 Test Policy

- i. Explain the benefits of creating a test policy (K2)
- ii. Evaluate suitability of test policy statements and identify possible improvements (K6)

2.2 Test Strategy

- i. Select appropriate content for test strategies. (K5)
- ii. Explain the benefits of a test strategy to different stakeholders. (K2)
- iii. Evaluate strategies for suitability to given scenarios and identify possible improvements. (K6)

2 Test Management Practice (continued...)

2.3 Test Plans

- i. Select appropriate content for test plans. (K5)
- ii. Explain the benefits of a test plan to different stakeholders. (K2)
- iii. Evaluate given test plans for suitability to given scenarios and identify possible improvements. (K6)

2.4 Test Reports

- i. Create a test report. (K5)
- ii. Evaluate a given report for suitability to intended audience and identify possible improvements. (K6)

2.5 Test Estimation

- i. Explain the benefits and drawbacks of test estimation techniques. (K2)
- ii. Evaluate estimates given for accuracy. (K4)
- iii. Prepare estimates for given projects. (K5)

2.6 Test Monitoring and Control

- i. Explain how overall test progress can be measured. (K2)
- ii. Devise options for achieving targets when progress is not as intended. (K5)

2.7 Incident Management

- i. Create an incident management process. (K5)
- ii. Suggest improvements to an existing incident management process. (K6)
- iii. Suggest test process improvements based on incident trends. (K6)

2 Test Management Practice (continued...)

2.1 Test Policy (0.5 hours)

This section builds on section 4.1 of the Intermediate Certificate syllabus; it provides guidance on the creation and uses of a test policy. There is no definitive standard on what a test policy is.

i. Explain the benefits of creating a test policy.

Explain what a test policy is – it considers the overall approach, culture and standards of the organisation doing the testing. It may be written by the IT department, but outlines the corporate view of testing practices.

Describe the typical contents of a test policy (the list below is not exhaustive; it suggests some of the areas that a test policy might address).

- Testing process to be followed (e.g. the fundamental test process or an in-house standard);
- Levels of testing to be undertaken (e.g. unit testing, system testing);
- Success factors (e.g. number of issues outstanding on release, code and requirements coverage to be achieved);
- The way that the value of testing will be measured;
- Organisational approach to test process improvement.

Explain the benefits of creating a test policy to each of the following stakeholder groups:

- Business.
- Project Management.
- Development Team.
- Test Team.

ii. Evaluate suitability of test policy statements and identify possible improvements.

Analyse a given test policy statement, assess its likely effectiveness in a given scenario, and suggest areas for improvement.

2 Test Management Practice (continued...)

2.2 Test Strategy (2 hours)

This section builds on section 4.1 of the Intermediate Certificate syllabus; it provides guidance on the creation and uses of a test strategy. There is no definitive standard on what a test strategy is.

i. Select appropriate content for test strategies.

Explain the relationship between a test strategy and a test policy within the test documentation hierarchy.

Describe the use of a test strategy as the vehicle for mitigating the risks of a particular project, by showing what testing needs to achieve in order to reduce (or remove) the risks identified.

Demonstrate awareness that strategies can be produced at organisational or department levels.

The list below shows typical contents of a test strategy (indicative list only):

- Standards which must be followed
- The scope of testing
- Risks to be addressed
- The extent of software re-use
- The levels of testing (e.g. unit testing, system testing)
- The types of testing (i.e. functional, non-functional)
- Entry criteria into each level of testing (paying attention to contributions required from other teams – e.g. business analysts, developers, project managers)
- Exit criteria out of each level of testing
- Completion criteria for the test effort
- Required test environment
- Test techniques to be used at each test level
- Tools to be used to support the testing
- Approach to incident management
- Approach to retesting and regression testing
- Approach to process improvement.

Select appropriate content for test strategies based on scenarios involving the following types of applications:

- Web-based applications
- Client-server applications
- Large mainframe applications
- PC-based applications.

2 Test Management Practice (continued...)

ii. Explain the benefits of a test strategy to different stakeholders.

Explain the benefits of creating a test strategy to each of the following stakeholder groups:

- Business
- Project Management
- Development Team
- Test Team.

iii. Evaluate strategies for suitability to given scenarios and identify possible improvements

Analyse a given strategy outline and suggest improvements based on information given.

2.3 Test Plans (1.5 hours)

This section builds on section 4.1 of the Intermediate Certificate syllabus.

i. Select appropriate content for test plans.

Explain the relationship between a project test plan and a test strategy within the test documentation hierarchy.

Explain the difference between a project test plan and a level (phase) test plan.

Using IEEE Std. 829 – 1998 Standard for Software Test Documentation as a guide, select appropriate content for project and level (phase) test plans.

ii. Explain the benefits of a test plan to different stakeholders.

Explain the benefits of creating a test plan to each of the following stakeholder groups:

- Business
- Project Management
- Development Team
- Test Team.

iii. Evaluate given test plans for suitability to given scenarios and identify possible improvements.

Analyse a given test plan (project or level) and suggest where it may be unsuitable to the scenario given and suggest improvements.

2 Test Management Practice (continued...)

2.4 Test Reports (1 hour)

This section builds on section 4.4 of the Intermediate Certificate syllabus.

i. Create a test report.

Explain the importance of regular reporting throughout a test project.

Describe how the levels and types of information presented will differ for the following reports:

- From testers to a test manager
- From a test manager to a project manager
- From a test manager to a development manager
- From a test manager to the business representatives.

Explain the use of an executive summary for each stakeholder above.

Write a test report based on a given situation, using IEEE Std. 829 – 1998 Standard for Software Test Documentation as a guide.

ii. Evaluate a given report for suitability to intended audience and identify possible improvements.

Analyse a given test report, assess its suitability for its intended audience in a given situation, and suggest improvements.

2.5 Test Estimation (1 hour)

This section builds on section 4.3 of the Intermediate Certificate syllabus.

i. Explain the benefits and drawbacks of test estimation techniques.

Compare and contrast the benefits and drawbacks of each of the following techniques:

- Intuition or guessing
- Based on metrics from previous testing efforts
- Formula based, using a technique such as Test Point Analysis (TPA) or a standard percentage of development time
- Consensus of knowledgeable people
- Detailed micro-estimates of all activities in a work breakdown structure.

ii. Evaluate estimates given for accuracy.

For each technique in 2.5 (i) above, describe what is required in order to provide an estimate. From information provided, assess the likely accuracy of estimates given.

iii. Prepare estimates for given projects.

Produce a work-breakdown structure for a given task, and prepare estimates based on information provided (e.g. metrics from previous projects).

2 Test Management Practice (continued...)

2.6 Test Monitoring and Control (1 hour)

This section builds on section 4.4 of the Intermediate Certificate syllabus.

i. Explain how overall test progress can be measured.

Explain how progress against time and quality can be measured. Explain the need for maintaining a risk register throughout the project.

Describe how information from individual testers can be combined to give an indication of overall test progress.

Explain how information on defects (in terms of their density in particular areas and trends over the project) can be used to give an indication of likely product quality.

ii. Devise options for achieving targets when progress is not as intended.

Explain the controlling actions which could be taken when testing is not progressing according to the plan, or the plan changes, including:

- Changing the test approach (such as using different test techniques, use of tools etc.)
- Reviewing the priority of tests
- Obtaining additional resources
- Extending the release date
- Changing the test completion criteria.

Describe the challenges involved in taking controlling actions such as extending the deadline or reducing the scope of testing.

Explain possible dependencies on other stakeholder groups (such as the development and business teams) on achieving test targets.

Propose suitable actions to control test progress in given scenarios.

2 Test Management Practice (continued...)

2.7 Incident Management (1 hour)

This section builds on section 4.5 of the Intermediate Certificate syllabus.

i. Create an incident management process.

Describe the key elements in an incident management process. In particular, explain the importance of severity and priority ratings, and impact assessments. Describe the challenges of gaining consensus on these. Explain why it is necessary to agree fix turn-around times with the development team.

Using IEEE 1044-1993 as a guide, create an incident management process suitable for use in a scenario, based on information given.

ii. Suggest improvements to an existing incident management process.

Analyse an incident management process and suggest improvements to it based on information given.

iii. Suggest test process improvements based on incident trends.

Describe how an incident trend analysis may be conducted. Discuss how information resulting from the analysis (such as cost to fix) could be used to aid process improvement.

3 Test Technique, Test Type and Test Coverage Selection (1.5 hours)

This section builds on sections 2, 5.3 and 5.4 of the Intermediate Certificate syllabus and section 3 of the Foundation Certificate syllabus. This section does not relate to the derivation of specific test cases for any technique given here. The section describes how the use of formal test techniques could assist in the test effort.

Learning Objectives

- i. Describe the advantages and disadvantages of using given test techniques, test types and test coverage measures in a given situation. (K4)
- ii. Determine the test design techniques and test types most appropriate for a given project. (K4)

3 Test Technique, Test Type and Test Coverage Selection (continued...)

i. Describe the advantages and disadvantages of using given test techniques, test types and test coverage measures in a given situation.

Explain under what circumstances each of the following could be used to aid the testing effort throughout the software development lifecycle.

Static Testing

Describe the advantages and disadvantages of each of the following review types:

- Management review
- Walkthrough
- Technical review
- Inspection

Discuss potential reasons for failure of a review process. Explain the role of managers (test managers, development managers and project managers) in making reviews happen.

Explain how the effectiveness of different review types can be evaluated.

Static Analysis

Discuss the use of static analysis techniques in the V-model and in iterative models.

Specification-based testing

Recognise that specification-based testing may include the testing of functional and non-functional requirements.

Analyse a scenario in order to determine which of the techniques and test types given below would be most suitable:

- Equivalence partitioning
- Boundary value analysis
- State transition testing
- Decision table testing
- Classification Tree Method
- Use-case testing

Describe the challenges in making use of these techniques, based on information given.

Explain when each of the coverage measures associated with the first 4 techniques, as defined in BS 7925-2 might be appropriate.

3 Test Technique, Test Type and Test Coverage Selection (continued...)

Structure-based testing

Analyse a scenario in order to determine which of the techniques and test types given below would be most suitable:

- Statement testing
- Decision testing.

Using Appendix C of BS7925-2, the Standard for Component Testing as a guide, explain the relationships between levels of coverage achieved by different techniques (the 'subsumes' model).

Explain when each of the structure-based coverage measures defined in BS 7925-2 might be appropriate.

Explain the potential benefits and challenges of achieving 100% coverage of each of the above referenced measures.

Experience-based techniques

Explain the potential benefits and problems of applying error guessing or exploratory testing to complement the test effort.

Test Types

Explain the potential benefits and problems of applying any combination of the following test types in a given scenario:

- Reliability testing
- Usability testing
- Testing under load

3 Test Technique, Test Type and Test Coverage Selection(continued...)

ii. Determine the test design techniques and test types most appropriate for a given project.

Analyse a scenario and suggest the optimum use of the review types listed in i above, based on information provided.

Analyse a scenario to determine whether static analysis would be useful, based on information provided.

Analyse a scenario to determine which of the techniques (if any) listed in i above would be most appropriate, based on information provided.

Analyse a scenario in order to determine which of the measures listed in i above would be most suitable, based on information provided.

Analyse a scenario in order to determine whether either or both of error guessing and exploratory testing would be suitable, based on information provided.

Analyse a scenario in order to determine which of the test types listed in i above would be most suitable, based on information provided.

4 Test Tool Selection & Implementation (1.5 hours)

This section builds on section 6 of the ISTQB Foundation syllabus.

Learning objectives

- i. Devise a tool selection process in a given scenario (K5)
- ii. Describe the typical roles of a tool implementation team. (K2)

i. Devise a tool selection process in a given scenario.

Recall the types of test tool available. Explain the factors which may affect their selection.

Devise a process for selecting a tool and identify the stakeholders who may need to be included in the process, based on information given.

Explain the challenges of implementing tools, and suggest ways that these may be overcome.

ii. Describe the typical roles of a tool implementation team.

Outline the typical roles of those in the implementation team:

- Champion – the driving force behind the day to day implementation of the tool.
- Implementer – plans and manages the implementation of the tool (including the pilot project). This person may also be the Champion.
- Tool Support – responsible for technical tool support, providing internal help or consultancy in the use of the tool.

Explain the role of the Management Sponsor in the tool selection and implementation process.

5 People Skills (2 hours)

This section is not referenced elsewhere within the ISEB syllabi for software testing.

The management of people is a dedicated and comprehensive topic in its own right. It is not expected that candidates will have in-depth knowledge of the topics given, but will be able to demonstrate some knowledge of the 'soft' side of testing.

The skills of good testers are many and varied; a selection of these has been provided as a guide. A knowledge of motivation theory, whilst useful, is not expected here. What is required is that candidates show awareness of the wider stakeholder view of the requirements of testing.

The suggestions given here are not prescriptive, but serve as a guide as to the required levels of knowledge.

Learning Objectives

- i. Describe individual skills of testers and test leaders (K2)
- ii. Explain alternative arrangements for test team organisation (K2)
- iii. Evaluate scenarios and offer suggestions for motivating project stakeholders to meet test requirements. (K6)

5 People Skills (continued...)

i. Describe individual skills of testers and test leaders

Individual Testers

Describe the knowledge and skills typically required of a tester, the sources from which those skills might be acquired and the value of previous experience in other areas. The list of skills might include (but is not limited to) the following:

- Knowledge of the software development process
- Knowledge of the business domain
- Knowledge of the test process
- Diplomacy when dealing with others
- Persistent approach to problem solving
- Communication skills.

Test Leaders

Describe the knowledge and skills typically required of a test manager or leader, including the above plus:

- Requirements gathering
- Delegation skills
- Ability to see the 'big' picture
- Reviewing the work of others
- Interviewing job applicants
- Giving praise and criticism
- Conflict management
- Negotiation skills
- Relationship management.

Explain the knowledge that testers from each of the following groups can bring to the test effort:

- a. Professional Testers
- b. Developers
- c. Business Analysts
- d. Users.

5 People Skills (continued...)

ii. Explain alternative arrangements for test team organisation.

Explain the importance of effective communication both within the test team and between the test team and other groups, such as developers and users.

Identify potential barriers to effective communication and co-operation within and between teams and explain how these can be overcome.

Explain the importance of inducting new members into an effective team and suggest ways in which the induction process can be made efficient and effective.

Explain the advantages and disadvantages of different structures, including:

- One person in the development team taking responsibility for testing.
- Dedicated test teams set up within each project.
- Central dedicated and independent test team.
- Central pool of expertise to give advice to projects.
- Outsourcing of testing to an independent third party organisation.
- Analyse situations and select the most appropriate test organisation structure (not limited to those listed above) for the given scenario.

iii. Evaluate scenarios and offer suggestions for motivating project stakeholders to meet test requirements

Identify factors that tend to motivate testers and those that tend to demotivate (hygiene factors), including the significance of recognition and respect and the existence of structured career paths and the limitations of financial rewards.

Assess situations to determine how best to motivate staff to achieve desired outcomes and propose a practical way to manage such situations. Typical situations might include, but not be limited to, the following:

- Encouraging the test team to write test procedures which are repeatable.
- Gaining agreement from the development manager to the test team's view of severity and priority of incidents.
- Persuading the business team to write down their requirements.
- Ensuring that an outsourced test team follows in-house procedures.
- Persuading the project manager to accept test estimates.

6 Test Process Improvement (1 hour)

This section is not referenced elsewhere within the ISEB syllabi for software testing.

It has been included to enable test managers to describe formal ways of assessing test processes and making improvements, to assist with the decision making process of their organisations. The intention is to demonstrate general awareness, not detailed knowledge.

Learning Objectives

- i. Describe formal methods for improving the test process (K2)

- i. Describe formal methods for improving the test process**

Provide a summary of the TPI and TMMi models for test improvement – for each explain:

- The origin of the model
- Examples of what is assessed
- How an assessment is conducted
- The outcome of an assessment.

Appendix A: Levels of Knowledge

The following levels of knowledge are defined as applying to this syllabus. Each topic in the syllabus will be examined according to the learning objectives defined elaborated in the section devoted to that topic. Each learning objective has a level of knowledge (K level) associated with it and this K level defines the nature of any examination questions related to that topic.

Note that each K level subsumes lower levels. For example, a K4 level topic is one for which a candidate must be able to analyse a situation and extract relevant information. A question on a K4 topic could be at any level up to and including K4. As an example, a scenario requiring a candidate to analyse a scenario and select the best risk identification method would be at K4, but questions could also be asked about this topic at K3 and a question at K3 for this topic might require a candidate to apply one of the risk identification methods to a situation.

Level 1: Remember (K1)

The candidate will recognise, remember and recall a term or concept. All topics in this syllabus require K1 level of understanding.

Example

Can recognise the definition of “failure” as:

- “non-delivery of service to an end user or any other stakeholder” or
- “actual deviation of the component or system from its expected delivery, service or result”.

Level 2: Understand (K2)

The candidate can select the reasons or explanations for statements related to the topic, and can summarise, compare, classify and give examples for the testing concept. All topics in this syllabus require K2 level of understanding.

Examples

Can explain the reason why tests should be designed as early as possible:

- To find defects when they are cheaper to remove.
- To find the most important defects first.

Can explain the similarities and differences between integration and system testing:

- Similarities: testing more than one component, and can test non-functional aspects.
- Differences: integration testing concentrates on interfaces and interactions, and system testing concentrates on whole-system aspects, such as end to end processing.

Level 3: Apply (K3)

The candidate can select the correct application of a concept or technique and apply it to a given context. No topics in this syllabus are at the K3 level but those at K4 level and above include a K3 level of understanding.

Examples

- Can identify boundary values for valid and invalid partitions.
- Can select test cases from a given state transition diagram in order to cover all transitions.

Level 4: Analyse (K4)

The candidate can separate information related to a concept or technique into its constituent parts for better understanding, and can distinguish between facts and inferences. Some topics in this syllabus require a K4 level of understanding.

Examples

- Can understand the various options available for risk identification and apply these to a practical situation..
- Can describe which portions of an incident report are factual and which are inferred from the results.

Level 5: Synthesise (K5)

The candidate can identify and build patterns in facts and information related to a concept or technique, and can create new meaning or structure from parts of a concept. Some topics in this syllabus require a K5 level of understanding.

Examples

- Can design a quality risk analysis process that includes both rigorous and informal elements.
- Can combine aspects of different review processes to form an effective process for their organisation.

Level 6: Evaluate (K6)

The candidate can judge the value of information and decide on its applicability in a given situation. Some topics in this syllabus require a K6 level of understanding.

Examples

- Can determine the relative effectiveness and efficiency of different review processes or different testing techniques.
- Can determine the type of information that should be gathered for an incident report.
- Can select appropriate content for a test plan in a given situation and justify the selections made.

References

(For the cognitive levels of learning objectives)

Bloom, B. S. (1956). *Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain*, David McKay, Co. Inc.

Anderson, L. W. and Krathwohl, D. R. (eds) (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Allyn & Bacon.

Appendix B: Rules for ISEB SWT Practitioner Level Syllabuses

Syllabus General Rules

SG1. The syllabus should be understandable and absorbable by people who hold the ISEB/ISTQB Foundation Certificate.

SG2. The syllabus should be more practical than theoretical.

SG3. The syllabus should be clear and unambiguous to its intended readers.

Syllabus Content

SC1. The syllabus should include recent testing concepts and should reflect current best practice in software testing where this is generally agreed and has been published. The syllabus is subject to review every three to five years.

SC2. The syllabus should minimise time-related issues, such as current market conditions, to enable it to have a shelf life of three to five years.

SC3. Each statement in the Syllabus should clearly state what the candidate is expected to know and therefore what can be examined. (E.g. "Explain that the criteria are" not "Explain the criteria for")

Learning Objectives

LO1. Learning objectives should distinguish between applicable knowledge levels according to Bloom's taxonomy (K1 to K6).

LO2. The description of the content should be consistent with the learning objectives.

LO3. To illustrate the learning objectives, sample exam questions for each major section should be issued along with the syllabus.

LO4. Each section of the syllabus should include a K-level

Structure rules

ST1. The structure of the syllabus should be clear and allow cross-referencing to and from other parts, from exam questions and from other relevant documents.

ST2. Overlap between sections of the syllabus should be minimised. Overlap between related syllabuses (Foundation, Intermediate, Analyst & Management) should be minimised, or stated (if intentional)

ST3. Each syllabus and each section of each syllabus should have the same structure and format.

ST4. The syllabus should contain version, date of issue and page number on every page.

ST5. The syllabus should include a guideline for the amount of time to be spent in each major section (to reflect the relative importance of each topic).

ST6. Each statement should be consistent with the ISTQB Foundation Syllabus (where it covers the same area) and should use the same terminology.

Syllabus References

SR1. Sources and references should be given for concepts in the syllabus to help training providers find out more information about the topic.

SR2. Where there are not readily identified and clear sources, more detail should be provided in the syllabus. For example, definitions are in the Glossary, so only the terms are listed in the syllabus.

Appendix C: Syllabus References

Standards and Syllabuses

This syllabus makes reference to the following syllabuses:

- [ISTQB F Syllabus] ISTQB Certified Tester: Foundation Level Syllabus (Version 2007)
- ISEB Intermediate Certificate in Software Testing.

This syllabus makes reference to the following standards:

- [ISTQB Glossary] ISTQB - Veenendaal, Erik van (ed.) (2006), Standard glossary of terms used in Software Testing, Version 2.0
- [BS 7925-2] BS 7925-2:1998, *Software Testing Part 2: Software Component Testing*
- [IEEE 829] IEEE Std 829™ (1998/2005) IEEE Standard for Software Test Documentation (currently under revision)

Books and Web Sites

Note that a standard will take precedence over a book. Where common practice differs from standard, candidates will not be penalised for using a standard approach. Nevertheless, candidates should show awareness of the differences from standard.

Standards may not give an effective view of techniques in use. The following books give worked examples of a range of techniques.

Use Case testing and the Classification Tree Method are not detailed in BS 7925-2. The following articles are easily available and provide a reference point for each technique:

- Use Case testing – Heumann *Generating Test Cases From Use Cases*, Rational Edge June 01: <http://www-128.ibm.com/developerworks/rational/library/content/RationalEdge/jun01/GeneratingTestCasesFromUseCasesJune01.pdf>
- Classification tree testing – Grochtmann *Test Case Design Using Classification Trees*, STAR'94: <http://www.systematic-testing.com/documents/star1994.pdf>

A treatment of Defect Detection Percentage may be found in:

- Fewster & Graham *Software Test Automation: Effective Use of Test Execution Tools*, Addison-Wesley (§8.4.1.1)

An example of an accessibility standard is:

- W3C's priority 1 checkpoints provide a minimum, standardised, comprehensible set of accessibility checkpoints for internet browsing. <http://www.w3.org/TR/WAI-WEBCONTENT/full-checklist.html>

Publicly-available defect taxonomies include:

- Kaner, Falk, Nguyen's *Testing Computer Software* (the comprehensive list at the back)
- Beizer/Vinter's taxonomy available from: <http://inet.uni2.dk/~vinter/bugtaxst.doc>