Institute for Apprenticeships & Technical Education

End-point assessment plan for Software Tester apprenticeship standard

Apprenticeship standard reference number	Apprenticeship standard level	Integrated end-point assessment
ST0129	4	No

Contents

Introduction and overview

This document sets out the requirements for end-point assessment (EPA) for the Software tester apprenticeship standard. It explains how EPA for this apprenticeship must operate.

It provides the EPA design requirements for end-point assessment organisations (EPAOs). It will also be useful for apprentices undertaking this apprenticeship, their employers and training providers.

EPA must be conducted by an EPAO approved to deliver EPA for this apprenticeship standard. Each employer should select an approved EPAO from the Education & Skills Funding Agency's Register of end-point assessment organisations (RoEPAO).

Full-time apprentices will typically spend 24 months on-programme (before the gateway) working towards this occupational standard. All apprentices must spend a minimum of 12 months on-programme. All apprentices must spend a minimum of 20% of on-programme time undertaking off-the-job training.

Before starting EPA, an apprentice must meet the gateway requirements. For this apprenticeship they are:

- the employer must be content that the apprentice is working at or above the occupational standard

- apprentices must have compiled and submitted a portfolio of evidence to underpin the professional discussion
- apprentices must have achieved English and mathematics at Level 2[1]

The EPAO must confirm that all required gateway evidence has been provided and accepted as meeting the gateway requirements. The EPAO is responsible for confirming gateway eligibility. Once this has been confirmed, the EPA period starts.

This EPA should then be completed within an EPA period lasting typically for two months.

This EPA consists of two discrete assessment methods.

It will be possible to achieve the following grades in each assessment method:

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[1] For those with an education, health and care plan or a legacy statement, the apprenticeship's English and Mathematics minimum requirement is Entry Level 3. British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

Assessment method 1: Scenario based test

· Fail
· Pass
· Distinction

Assessment method 2: Professional discussion underpinned by portfolio

· Fail
· Pass
· Distinction

Performance in the EPA will determine the overall apprenticeship standard grade of:

· Fail
· Pass
· Merit
· Distinction

EPA summary table

On-programme (typically, 24 months)	Training to develop the knowledge, skills and behaviours (KSBs) of the occupational standard. Training towards English and mathematics Level 2, if required. Compiling a portfolio of evidence.
End-point assessment gateway	The employer must be content that the apprentice is working at or above the occupational standard. Apprentices must have achieved English and mathematics Level 2 Apprentices must submit a portfolio of evidence to underpin the professional discussion.
End-point assessment (which will typically take 2 months)	Assessment method 1: **Scenario based test** With the following grades: · Fail · Pass · Distinction Assessment method 2: **Professional discussion underpinned by portfolio** With the following grades: · Fail · Pass · Distinction Performance in the EPA will determine the overall apprenticeship standard grade of: · Fail · Pass · Merit · Distinction

Length of end-point assessment period

The EPA will be completed within an EPA period lasting typically two months, starting when the EPAO has confirmed that all gateway requirements have been met.

Order of assessment methods

The assessment methods can be delivered in any order.

EPA Gateway

The apprentice should only enter the gateway once the employer is content that the apprentice is working at or above the occupational standard. In making this decision, the employer may take advice from the apprentice's training provider(s), but the decision must ultimately be made solely by the employer.

The EPAO determines when all other gateway requirements have been met, and the EPA period will only commence once the EPAO has confirmed this.

In addition to the employer's confirmation that the apprentice is working at or above the level in the occupational standard, the apprentice must have completed the following gateway requirements prior to beginning EPA:

- Achieved English and mathematics at Level 2.
  For those with an education, health and care plan or a legacy statement, the apprenticeship's English and Mathematics minimum requirement is Entry Level 3.
  British Sign Language (BSL) qualifications are an alternative to English qualifications for those who have BSL as their primary language.

For scenario-based test with questions

- no specific requirements

For the professional discussion, the apprentice will be required to submit:

- portfolio of evidence

Portfolio of evidence requirements:

- apprentices must compile a portfolio of evidence during the on-programme period of the apprenticeship
- it must contain evidence related to each of the KSBs that will be assessed by the professional discussion
- the portfolio of evidence will typically contain ten discrete pieces of evidence
- evidence should be mapped by the apprentice against the KSBs assessed by the professional discussion (see mapping of KSBs)
- evidence may be used to demonstrate more than one KSB; a qualitative as opposed to quantitative approach is suggested
- evidence sources may include:
  - workplace documentation, for example workplace policies/procedures, records
  - witness statements
  - annotated photographs
  - video clips (maximum total duration 10 minutes); the apprentice must be in view and identifiable at all times

  This is not a definitive list; other evidence sources are possible.

- it should not include any methods of self-assessment
- any employer contributions should focus on direct observation of performance (for example witness statements) rather than opinions
- the evidence provided must be valid and attributable to the apprentice; the portfolio of evidence must contain a statement from the employer and apprentice confirming this
- the portfolio of evidence must be submitted to the EPAO at the gateway

The portfolio is not directly assessed. It underpins the professional discussion and therefore should not be marked by the EPAO. EPAOs should review the portfolio in preparation for the professional discussion but are not required to provide feedback after this review of the portfolio.

End-point assessment methods
Assessment method 1: Scenario based Test (This assessment method has 2 components.)

Assessment method 1 component 1: Scenario based Test

Overview

Apprentices must complete 3 scenario-based tests in which they will demonstrate the KSBs assigned to this assessment method. The scenarios will be simulated and provided remotely online by the EPAO. The scenario-based tests which will be made up of tasks that would naturally occur as a Software Tester in their normal workplace. They will demonstrate the KSBs assigned to this assessment method through the completion of the scenario tasks.

The products of each scenario will be submitted online to the independent assessor through a secure portal and these will be assessed and scored, supplemented by questioning by the independent assessor to establish the apprentice's understanding of underpinning reasoning for their actions within the scenarios.

The total time permitted for the scenario-based tests is 9 hours typically over 2 consecutive working days. A working day is typically considered to be 7.5 hours long

Questioning will take place on a separate date (to be arranged between the EPAO and employer) after completion of all 3 scenario-based tests to allow the independent assessor time to review and grade the outputs of each scenario.

Each of the scenario-based tests may not be split, other than to allow comfort breaks, as necessary.

The apprentice will be given access to one scenario test at a time by the administrator of the test and they will complete that scenario-based test before going on to the next based on the individual scenario timings provided below.

The EPAO will agree the scheduling of the scenario-based tests and the questioning with the employer, including the time the independent assessor requires between completion of the scenario and the questioning, all to typically complete within the total 10 working days. The independent assessor must have a minimum of 5 working days to review the outputs and formulate their questions.

The scenario-based tests must be invigilated by a responsible person. The EPAO is responsible for ensuring the security of the scenario test.

The rationale for this assessment method is:

Scenario-based tests allow a practical assessment of competence and involves direct testing under controlled conditions. Undertaking the scenario-based tests in a controlled environment allows for pre-determined independent assessor training and assessment resources to be developed and helps to guarantee the required demand and challenges that appear during this end-point assessment method.

8

In this occupation an observation of practice in a live setting was not selected, as the apprentice is not likely to cover the breadth and depth of practice required. Scenario based tests avoid situations where occupational activities are not available or do not occur on the day and avoids issues around confidentiality or exposing an organisation's confidential information. The apprentice will be presented with scenarios where they will be able to demonstrate how they can apply their knowledge, skills and behaviours.

Delivery

Apprentices must be provided with written instructions on the tasks they must complete, including the timescales they are working to at the start of each task.

The scenario-based test should be conducted in the following way:

1) The scenario-based test must be overseen by an invigilator to ensure that the apprentice completes the assessment independently. This task must be undertaken face to face or online by use of a video camera to ensure that the apprentice is undertaking the scenario-based test assessment unaided.

2) The virtual environment must include a facility for the apprentice to make brief explanatory notes of critical decision-making activities that underpin completion of the tasks in the practical assessment scenarios. These notes are key to enabling the independent assessor to understand why the practical test solutions were arrived and help ascertain the depth of understanding required to test occupational competence against the assigned KSBs.

3) Each of the scenario tasks will have a detailed brief and instructions for the apprentice – and this will be contained within the software package for delivering the assessment and will not be available until the apprentice begins the scenario-based test. The invigilator is responsible for releasing the briefs for each scenario via the online platform based on the timings within this end--point assessment plan.

4) Each scenario-based test will specify what systems, tools and platforms will be required to complete the tasks.

One week in advance of the scenario demonstrations the EPAO must provide the apprentice and employer with an Information guidance document, with information on the format of the test, including timescales as well as procedure and policy documents required as context for the scenarios. Apprentices can make notes on these documents and bring them to the scenario demonstration.

The scenario-based tests should be conducted in the following way:

- The apprentice will be presented with scenarios which would be found relevant to their normal sphere of work.
- The apprentice will be provided with a scenario of no more than 250 words together with an Information Pack with supporting information (for example Screenshots, Data for analysis, Reports, Articles, Documentation).

The scenario-based test must not hamper the opportunity for the apprentice to demonstrate occupational competence in the KSBs assigned to this assessment method.

Apprentices must conduct the scenario-based tests in a suitably controlled environment that is a quiet space, free of distractions and influence. The invigilation can be carried out by a responsible person nominated by the EPAO independent assessor. The EPAO is required to have an invigilation policy that will set out how the scenario-based tests will be carried out. The EPAO is responsible for ensuring the security of scenario demonstrations they administer to ensure the assessment remains valid and reliable (this includes any arrangements made using online tools). The EPAO is responsible for verifying the validity of the identity of the person carrying out the demonstrations.

If the scenario-based test is undertaken remotely the EPAO must ensure that the apprentice is unable to gain an advantage through materials in the room, screen sharing or other behaviours.

There may be breaks during the scenario-based test to allow for meal and comfort breaks. Apprentices must be supervised during all planned and unplanned breaks.

The independent assessor will make all grading decisions.

Scenarios

Scenarios will be based on the following 3 topics:

Scenario 1 – Testing from given Requirements Specification and Acceptance Criteria (6 hours)

Example content:

- Identify, record, and update the status of testing tasks
- Identify test types, scenarios, and ideas/conditions to conduct on an exploratory basis, including suitable test techniques that could be employed
- Execute exploratory testing across more than one update of the application
- Maintain a log of defects
- Identify required interactions with other roles in the team
- Represent testing aspects in a retrospective/review
- Differentiate the typical approach to testing, including its interaction with other development activities and people, dependent on whether the scenario is conducted as part of an Agile/Iterative or Traditional/Sequential development lifecycle.

Note: The Requirements Specification can be expressed as User Stories, Use Cases, or narrative.

Scenario 2 – Use of static test techniques and Test Process context (90 minutes)

Example Content:

- From a given Test Plan and Requirements Specification, perform a review of the Specification using a given checklist
- Identify and record defects, including type, severity and priority based on the risks identified in the Test Plan

Note: The Requirements Specification can be expressed as User Stories, Use Cases, or narrative

Scenario 3 – Apply Black Box test techniques (90 minutes)

Example Content:

- Select suitable test techniques that could be used to test given scenarios
- Identify the parameters required for the implementation of a test technique in a given scenario
- Build detailed Test Cases for a specified test technique in a given scenario

Software – Any tools and their outputs used in the workplace to support software testing activities, together with formal or informal visuals and graphics. Defect seeded Software appropriate for the execution of Software Testing. Topics to be included in the test will be those evidenced by the KSBs

The EPAO must verify the suitability of the venue for taking the test and the identity of the person taking the test.

Practical arrangements

The Scenario based Test must be conducted in one of the following locations:

- the employer's premises
- a suitable venue selected by the EPAO (e.g. a training provider's premises or another employer's premises)
- online streaming

The venue must:

- Have reliable access to Internet access
- Have access to reliable devices able to operate the practical assessment software
- Be a controlled environment for the scenario-based test to be conducted.

Question and resources development

EPAOs will create and set scenarios to assess related underpinning KSBs.

EPAOs will produce specifications to outline in detail how the scenario-based assessments will operate, what it will cover and what should be looked for. It is recommended that this be done in consultation with employers. EPAOs should put measures and procedures in place to maintain the security and

confidentiality of their specifications if employers are consulted. Specifications must be standardised by the EPAO.

The scenario-based test must be delivered through a virtual environment using appropriate software and the independent assessor will not be present during the completion of the online scenarios.

EPAOs must develop 'practical specification banks' of sufficient size to prevent predictability and review them regularly (and at least once a year) to ensure they, and the specifications they contain, are fit for purpose. The specifications, including questions relating to underpinning KSBs must be varied, yet allow assessment of the relevant KSBs.

Each scenario-based test (and its constituent tasks) will present a typical business task, appropriate to an SME, an IT business, a large corporate or a non-IT business, and in the public and private sectors.

Each scenario-based test will include the scenarios as outlined above which will include a short summary of the tasks to be undertaken.

The EPAO will select the scenario-based assessment the individual apprentice will take.

Each scenario-based assessment will balance the need to:
 a) be specific to ensure consistency and comparability.
 b) be sufficiently flexible to allow apprentices to apply the approaches in their job role.

Existing scenario-based tests and their constituent tasks will be rotated, and new ones introduced.

The outputs of the tasks will be assessed by the Independent Assessor against the KSBs assigned to this method as shown in the Mapping section and a grade assigned using the descriptors in Annex A).

The combined outputs from the scenario-based test and questioning must evidence all mapped KSBs to the appropriate level in line with grading descriptors for the Assessment Method as a whole to be passed.

Required supporting material

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EPAOs will produce the following material to support this assessment method:

•   Outline of the assessment method's requirements

•   Marking materials

•   Reference policies and procedures for the scenario-based tests

•   A guidance document, with information on the format of the test, including timescales

•   Provide the grading criteria for the independent assessors to use and record

Assessment method 1 component 2: Questioning

Overview

This component will take the form of questioning which must be appropriately structured to draw out the best of the apprentice's competence and excellence and cover the KSBs assigned to this assessment method. It will involve questions that will focus on coverage of the practical assessment activity.

The rationale for this assessment method is:

It is usual for people in this occupation to engage in detailed technical questioning, about their software testing tasks and outputs to explain their reasoning for taking particular approaches and test the parameters of their decision making so this assessment method mirrors their day to day work. This will allow the apprentice to add depth to the scenario-based test outcomes and provide further evidence of competence

Delivery

The independent assessor will conduct and assess the questioning.

The questioning will happen after the online scenario-based test has been completed and been marked by the EPAO. The outputs from the scenario-based test will be shared with the apprentice by the independent assessor online throughout the questioning to ensure that the appropriate evidence under review is mutually understood. No outputs may be removed saved or shared from the assessment by the apprentice either in advance of or after the questioning to protect the integrity of the test.

The questioning must last for 45 minutes. The independent assessor has the discretion to increase the time of the questioning by up to 10% to allow the apprentice to complete their last answer. The independent assessor will ask a minimum of 9 open questions derived from the topics outlined above. The allocation of time and questioning strategy is at the independent assessor's discretion arising from their review of the scenario-based test outputs.

During this method, the independent assessor must use questions generated by themselves.

The questioning will be conducted as set out here:

- to check the knowledge & skills shown in the scenario-based test and explore the underpinning reasoning for any activity in the assessment by the apprentice where the supporting notes may be insufficiently detailed or ambiguous.

Video conferencing or online streaming can be used to conduct the questioning, but the EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided in some way.

The independent assessor must use the assessment tools and procedures that are set by the EPAO to record the questioning and answers given.

The independent assessor will make all grading decisions.

Venue

The questioning should take place in a quiet room, free from distractions and influence.

The questioning can take place in any of the following:

- employer's premises

- a suitable venue selected by the EPAO (for example a training provider's premises
- online through live streaming

Other relevant information

EPAOs must ensure that apprentices have a different set of scenario-based tests and associated questions in the case of re-sits/re-takes.

Independent assessors must be developed and trained by the EPAO in the conduct of professional discussion and reaching consistent judgement.

EPAOs will produce the following material to support this assessment method:

- outline of the assessment method's requirements
- marking / grading materials
- schema of answers for the scenario-based test outcomes that forms the basis of the questioning

Assessment method 2: Professional discussion with Portfolio

(This assessment method has 1 component.)

Overview

This assessment will take the form of a professional discussion which must be appropriately structured to draw out the best of the apprentice's competence and excellence and cover the KSBs assigned to this assessment method. It will involve the questions that will focus on coverage on the KSBs assigned to this method of assessment.

The rationale for this assessment method is:

This assessment method was selected as a valid way to draw out KSBs the behaviours, which would be less likely to naturally occur in the scenario-based test. It is commonplace for people in this occupation to engage in detailed technical discussions, so this assessment method mirrors their day to day work. This will allow some KSBs which may not naturally occur in every workplace or may take too long to observe to be assessed and the assessment of a disparate set of KSBs.

Delivery

The independent assessor will conduct and assess the professional discussion.

The professional discussion must last for 75 minutes. The independent assessor has the discretion to increase the time of the professional discussion by up to 10% to allow the apprentice to complete their last answer.

During this method, the independent assessor must generate their own questions.

The professional discussion will be conducted as set out here:

The portfolio is submitted to the EPAO at the gateway. The independent assessor should have 10 working days prior to the professional discussion to review the portfolio. A copy can be retained by the apprentice and brought by them to the professional discussion.

This is a 1:1 conversation in an appropriate environment (a quiet room free from distraction).

The portfolio will be used by the apprentice to refer to exemplify a point. Questioning will be used to authenticate evidence, experience, and competence.

Video conferencing can be used to conduct the professional discussion, but the EPAO must have processes in place to verify the identity of the apprentice and ensure the apprentice is not being aided in some way.

The independent assessor will ask a minimum of 10 open questions. Questions must be generated by the independent assessor. Follow up questions will then be used to draw out further evidence or where clarification is required

The independent assessor must use the assessment tools and procedures that are set by the EPAO to record the professional discussion.

The independent assessor will make all grading decisions.

Venue
The professional discussion should take place in a quiet room, free from distractions and influence.

The professional discussion can take place in any of the following:

- employer's premises
- a suitable venue selected by the EPAO (for example a training provider's premises)
- online using video conferencing or online streaming

Other relevant information
EPAOs must ensure that apprentices have a different set of questions in the case of re-sits/re-takes.

Independent assessors must be developed and trained by the EPAO in the conduct of professional discussion and reaching consistent judgement.

EPAOs will produce the following material to support this assessment method:

- o outline of the assessment method's requirements
- o marking materials
- o question bank

Reasonable adjustments
The EPAO must have in place clear and fair arrangements for making reasonable adjustments for this apprenticeship standard. This should include how an apprentice qualifies for reasonable adjustment and what reasonable adjustments will be made. The adjustments must maintain the validity, reliability and integrity of the assessment methods outlined in this assessment plan.

Weighting of assessment methods

All assessment methods are weighted equally in their contribution to the overall EPA grade.

Grading
Assessment method 1: Scenario-based Test

Fail - Does not meet the pass criteria

KSBs	Pass	Distinction
K2 K3 K4 K6 K11 K14 K16 S1 S2 S3 S7 B4 B5	Highlight the relationship between error, defect, and failure including the distinction between the root cause of a defect and its effects (K2) Describe the impact of context on the software test process including the activities, tasks and work products that support the test process (K3) Explain why and how they record traceability between requirements and the software test work products (K4) Apply static testing techniques as part of highlighting their role in early defect detection (K11/S1) Explain the pitfalls of not recording/benefits of recording clear and accurate software test documentation, results and defects (K6) Describe the role of software testing within the context of project and product risk reduction in the systems development life cycle (K14) List the typical metrics to support the monitoring and control of testing (K16) Demonstrate how they select and apply the following Black Box test techniques: • Equivalence Partitioning • Boundary Value Analysis • Decision Table Testing	Extrapolate the results from testing to summarise and evaluate metrics in relation to: • Meeting exit criteria/definition of done • Analysing the impact of change • Recommending actions • Identifying scope for improvement (K4, K6, K16, S3) Justify the selection of appropriate Test Techniques for the scenario situations given. (K3, S2)

• State Transition Testing (S2) Demonstrate how they analyse test objectives and requirements/test basis to define test scope and coverage criteria (S3) Show how they adapt and apply the testing activities according to industry standard development methodologies (sequential and iterative) (S7) Explain how they apply logical thinking to their Software Test activities. (B4) Explain how they use informal and formal techniques to deconstruct a scenario or test basis to identify tests that will demonstrate software and systems are fit for purpose. (B5)	

Assessment method 2: Professional discussion underpinned by portfolio

Fail – Does not meet the pass criteria

KSBs	Pass	Distinction
K1 K5 K7 K8 K9 K10 K12	Describe how the fundamental principles, objectives and psychology of testing, influence testing activities including the relationship between testing and quality assurance (K1, K5) Describe how the fundamental test process activities are influenced by the context of the software development lifecycle utilised and how they could be adapted to a different lifecycle approach and other project development contexts (K7, K8,) Outline the characteristics of software architecture that impact on software	Evaluate how their use of tools has contributed to improvements in productivity, processes, or product quality (K17, S4) Evaluate the risk mitigation that has been achieved using by non-functional testing activities. (K9, S8) Describe how a testing mindset has helped to prevent problems and identify areas for improvement in software testing and development processes, skills and tools. (K5, B3) Give examples of how the needs of different audience types have been considered,

K13 **K15**	testing in the development lifecycle (K21)	overcoming communication barriers to be able to inform, convince, and influence them in regard to product quality. (S12, B7)
K17 **K18** **K19**	Describe the need for conformance to specific industry standards where appropriate (such as GDPR, health informatics, safety critical, etc.) and how they have conformed to them related to software testing (K19, S10)	
K20 **K21** **K22** **K23**	Explain where Software Testers fit within the wider team and the roles and responsibilities that others play, identifying core testing behaviours, skills and tools applicable across roles (K17, K20, K22)	
S4 **S5** **S5** **S6**	Explain how they have applied, supported and been aware of the objectives of testing at different Test Levels (such as Unit Component Testing, Component Integration Testing, System Testing, System Integration Testing and User Acceptance Testing). (K10, S9)	
S8 **S9** **S10**	Explain how they have applied a range of different software test types within the broad categories of Functional, Non-Functional (Security, Performance & Usability) and White Box/Structural testing (K9, S8)	
S11 **S12**	Describe the characteristics of Black Box, White Box and Experience-based Test Techniques and how to apply specific techniques (K12/K13)	
S13 **B1** **B2**	Describe the defect management process and show how they have used defect tracking tools to support the process in force at their workplace (K15, S6)	
B3 **B6** **B7**	Describe how they record, interpret, report and communicate clear, accurate and traceable test documentation, results, defects and status in line with Testing Policy/Strategy/Standards in force. (S12)	

Describe the role of test automation in the software development lifecycle and how they have used test automation, management, or any other tools to support software testing (K17, K18, S4)

Describe the typical security vulnerabilities that should be addressed by testing in general and specifically by penetration testing (K23)

Describe how they have implemented a regression testing strategy, including why and how they have selected specific tests for regression testing, identification of tests suitable for automation, and the on-going maintenance of a regression suite. (S5)

Describe how they have maintained up to date knowledge of technological developments in the field of Software Testing (S11)

Describe how they design and follow tests to achieve coverage criteria. (S13)

Explain how they maintain a productive, professional and secure working environment (B1)

Show how they work independently and take responsibility for work outcomes regarding risk, managing timescales and workload staying motivated and committed when facing challenges (B2)

Discuss how they have adopted a problem-solving mindset within their own remit, being inquisitive and resourceful when faced with a problem to solve. Apply appropriate solutions. ensuring the true root cause of any problem is found

| | and a solution is identified which prevents recurrence. (B3)

Discuss how they work collaboratively with a wide range of people in different roles, internally and externally, with a positive attitude to inclusion & diversity (B6)

Explain how they communicate effectively in a wide variety of situations both internally and externally presenting complex information to technical and non-technical audiences (B7) | |

Overall EPA grading

All assessment methods are weighted equally in their contribution to the overall EPA grade.

Performance in the EPA will determine the apprenticeship grade of fail, pass, or distinction.

Independent assessors must individually grade the scenario-based test with questions and professional discussion underpinned by a portfolio of evidence, according to the requirements set out in this plan.

EPAOs must combine the individual assessment method grades to determine the overall EPA grade.

Apprentices who fail one or more assessment method will be awarded an overall EPA fail.

In order to gain an overall EPA pass, apprentices must achieve a pass in all the assessment methods.

In order to gain an overall EPA merit, apprentices must achieve a pass in one assessment method and a distinction in the other assessment method.

In order to achieve an overall EPA distinction, apprentices must achieve a distinction in the scenario-based test with questions and a distinction in the Professional Discussion underpinned by a portfolio of evidence.

Grades from individual assessment methods should be combined in the following way to determine the grade of the EPA as a whole:

Assessment method 1	Assessment method 2	Overall grading
Fail	Any grade	Fail
Any grade	Fail	Fail
Pass	Pass	Pass
Pass	Distinction	Merit
Distinction	Pass	Merit
Distinction	Distinction	Distinction

Any grade = fail, pass, or distinction

Re-sits and re-takes

Apprentices who fail one or more assessment method will be offered the opportunity to take a re-sit or a re-take at the employer's discretion. The apprentice's employer will need to agree that either a re-sit or re-take is an appropriate course of action.

A re-sit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for a re-sit or a re-take.

An apprentice who fails one or more assessment methods, and therefore the EPA in the first instance, will be required to re-sit or re-take the failed assessment method(s) only.

The timescales for a re-sit/re-take is agreed between the employer and EPAO. A re-sit is typically taken within two months of the EPA outcome notification. The timescale for a re-take is dependent on how much re-training is required and is typically taken within four months of the EPA outcome notification.

All assessment methods must be taken within a six-month period, otherwise the entire EPA will need to be re-sat/re-taken.

Re-sits and re-takes are not offered to apprentices wishing to move from pass to a higher grade.

Where any assessment method must be re-sat or re-taken, the apprentice will be awarded a maximum EPA grade of pass, unless the EPAO determines there are exceptional circumstances requiring a re-sit or re-take.

Roles and responsibilities

Role	Responsibility
Apprentice	As a minimum, apprentices should: • participate in and complete on-programme training to meet the KSBs as outlined in the occupational standard for a minimum of 12 months • undertake 20% off-the-job training as arranged by the employer and EPAO • understand the purpose and importance of EPA undertake the EPA including meeting all gateway requirements
Employer	As a minimum, employers should: • work with the training provider (where applicable) to support the apprentice in the workplace to provide the opportunities for the apprentice to develop the KSBs • arrange and support a minimum of 20% off-the-job training to be undertaken by the apprentice • decide when the apprentice is working at or above the occupational standard and so is ready for EPA • select the EPAO • ensure that all supporting evidence required at the gateway is submitted in accordance with this EPA plan • remain independent from the delivery of the EPA • confirm arrangements with the EPAO for the EPA (who, when, where) in a timely manner (including providing access to any employer specific documentations as required, for example company policies) • ensure that the EPA is scheduled with the EPAO for a date and time which allow appropriate opportunity for the KSBs to be met • ensure the apprentice is well prepared for the EPA

	• ensure the apprentice is given sufficient time away from regular duties to prepare for and complete all post-gateway elements of the EPA, and that any required supervision during this time (as stated within this EPA plan) is in place • where the apprentice is assessed in the workplace, ensure that the apprentice has access to the resources used on a daily basis
EPAO	As a minimum, EPAOs should: • make all necessary contractual arrangements, including agreeing the price of the EPA • understand the occupational standard • appoint administrators (and invigilators where required) to administer the EPA as appropriate • provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading • provide adequate information, advice and guidance documentation to enable apprentices, employers and training providers to prepare for the EPA • arrange for the EPA to take place, in consultation with the employer • conform to the requirements of this EPA plan and deliver its requirements in a timely manner • develop and provide appropriate assessment recording documentation to ensure a clear and auditable process is in place for providing assessment decisions and feedback to all relevant stakeholders • have no direct connection with the apprentice, their employer or training provider. In all instances including when the EPAO is the training provider (i.e. HEI) there must be no conflict of interest • have policies and procedures for internal quality assurance (IQA), and maintain records of regular

	and robust IQA activity and moderation for external quality assurance (EQA) purposes • conform to the requirements of the nominated external quality assurance provider (EQAP) • conform to the requirements of the Register of End-Point Assessment Organisations (RoEPAO) • deliver induction training for independent assessors, and for invigilators and markers where used • undertake standardisation activity on this apprenticeship standard for all independent assessors before they conduct an EPA for the first time, if the EPA is updated and periodically as appropriate (a minimum of annually) • manage invigilation of apprentices in order to maintain security of the assessment in line with their malpractice policy • verify the identity of the apprentice being assessed • use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard • request certification via the Apprenticeship Service upon successful achievement of the EPA • develop and produce assessment materials including specifications and marking materials (for example mark schemes, practice materials, training material) • appoint suitably qualified and competent independent assessors • provide details of the independent assessor's name and contact details to the employer • have and apply appropriately an EPA appeals process
Independent assessor	As a minimum, an independent assessor should: • have the competence to assess the apprentice at this level and hold any required qualifications and experience in line with the requirements of the independent assessor as detailed in the IQA section of this EPA plan

	- understand the occupational standard and the requirements of this EPA - have, maintain and be able to evidence up to date knowledge and expertise of the subject matter - deliver the end-point assessment in-line with the EPA plan - comply with the IQA requirements of the EPAO - have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances including when the EPAO is the training provider (i.e. HEI) - attend induction training - attend standardisation events when they begin working for the EPAO, before they conduct an EPA for the first time and a minimum of annually on this apprenticeship standard - assess each assessment method, as determined by the EPA plan, and without extending the EPA unnecessarily - assess against the KSBs assigned to each assessment method, as shown in the mapping of assessment methods and as determined by the EPAO, and without extending the EPA unnecessarily - make all grading decisions - record and report all assessment outcome decisions, for each apprentice, following instructions and using assessment recording documentation provided by the EPAO, in a timely manner - use language in the development and delivery of the EPA that is appropriate to the level of the occupational standard
Training provider	As a minimum, the training provider should: work with the employer and support the apprentice during the off-the-job training to provide the opportunities to develop the knowledge, skills and behaviours as listed in the occupational standard

26

	• conduct training covering any knowledge, skill or behaviour requirement agreed as part of the Commitment Statement (often known as the Individual Learning Plan). • monitor the apprentice's progress during any training provider led on-programme learning • advise the employer, upon request, on the apprentice's readiness for EPA remain independent from delivery of the EPA. Where the training provider is the EPA (i.e. a HEI) there must be procedures in place to mitigate against any conflict of interest
Invigilators	As a minimum, invigilators should: • attend induction training as directed by the EPAO • have no direct connection or conflict of interest with the apprentice, their employer or training provider; in all instances, including when the EPAO is the training provider (i.e. HEI) • invigilate and supervise apprentices during tests and in breaks during assessment methods to prevent malpractice in accordance with the EPAO's invigilation procedures

Internal Quality Assurance (IQA)

Internal quality assurance refers to the strategies, policies and procedures that EPA organisations must have in place to ensure valid, consistent and reliable end-point assessment decisions. EPAOs for this EPA must adhere to all requirements within the Roles and Responsibilities section and:

- have effective and rigorous quality assurance systems and procedures that ensure fair, reliable and consistent assessment across employers, places, times and independent assessors
- appoint independent assessors who have recent relevant experience of the occupation/sector gained in the last three years or significant experience of the occupation/sector and evidence of continued professional development
- appoint independent assessors who are competent to deliver the end-point assessment
- operate induction training for independent assessors, markers and invigilators
- provide training for independent assessors in terms of good assessment practice, operating the assessment tools and grading
- where appropriate:
    - provide ongoing training for markers
    - provide ongoing training for invigilators
- undertake standardisation activity on this apprenticeship standard for all independent assessors:
    - before they conduct an EPA for the first time
    - if the EPA is updated
    - periodically as appropriate (a minimum of annually)
- conduct effective moderation of assessment decisions and grades
- conduct appeals where required, according to the EPAO's appeals procedure, reviewing and making final decisions on assessment decisions and grades

Affordability

Affordability of the EPA will be aided by using at least some of the following practices:

- using employers' facilities for the scenario-based test with questioning
- using an employer's venue for the professional discussion underpinned by a portfolio of evidence
- using video conferencing for the professional discussion underpinned by a portfolio of evidence

Professional body recognition

Professional body recognition is not relevant to this occupational apprenticeship.

Mapping of knowledge, skills and behaviours (KSBs)

Assessment method 1: Practical Test

Knowledge
K2 the difference between error, defect, and failure including the distinction between the root cause of a defect and its effects
K3 the impact of context on the test process including the activities, tasks and work products that support the test process
K4 the need for traceability between the requirements/test basis and the test work products
K6 the importance of accuracy and clear documentation of software tests and defects.
K11 the role of static testing techniques and the review process in early defect detection
K14 the role of software testing within the context of project and product risk reduction in the systems development life cycle.
K16 the typical metrics used to support the monitoring and control of testing

Skills
S1 Apply static test techniques
S2 apply Black Box test techniques such as Equivalence Partitioning, Boundary Value Analysis, Decision Table Testing and State Transition Testing
S3 analyse test objectives and requirements/test basis to define test scope and coverage criteria
S7 adapt and apply testing activities according to industry standard development methodologies (sequential and iterative).

Behaviours
B4 Applies logical thinking, for example, uses clear and valid reasoning when making decisions related to undertaking the work instructions
B5 Analytical - able to use informal and formal techniques to deconstruct a scenario or test basis to identify tests that will demonstrate software and systems are fit for purpose.

Assessment method 2: Professional discussion underpinned by portfolio

Knowledge
K1 the relationship between testing and quality assurance and how testing contributes to higher quality
K5 the principles underpinning the psychology of testing including how the required mindset differs from the development mindset, and how this can influence success of software testing activities
K7 the relationship between test activities and software development activities in the Software Development Lifecycle.
K8 the application of testing across different recognised software development methodologies (sequential and iterative)
K9 the range and features of software test types within the broad categories of Functional, Non-Functional, White Box/Structural and Change-related Testing.
K10 the objectives and approaches for testing at different Test Levels (such as Unit Testing, Component Integration Testing, System Testing, System Integration Testing and User Acceptance Testing).
K12 the characteristics of Black Box, White Box and Experience-based Test Techniques
K13 the application of common Black Box Techniques to derive test conditions and test cases (Equivalence Partitioning, Boundary Value Analysis, Decision Table Testing and State Transition Testing)
K15 the defect management process
K17 the classification of tools to support testing
K18 the role of test automation in the context of the software development lifecycle
K19 the need for conformance to specific industry standards where appropriate (such as GDPR, health informatics, safety critical, etc.) related to software testing
K20 where Software Testers fit within the wider team and the roles and responsibilities that others play
K21 the characteristics of software architecture that impact on software testing in the development lifecycle
K22 the core testing behaviours, skills and tools that are common to developers, testers and multi-skilled roles in development lifecycles
K23 the typical security vulnerabilities that should be addressed by testing in general and specifically by penetration testing

Skills
S4 use tools to automate, manage or support any test activity.
S5 Apply a regression strategy including selection of tests, maintenance of regression suites and identifying tests suitable for automation.
S6 use defect tracking tools.
S8 apply the range of different software test types within the broad categories of Functional, Non-Functional (Security, Performance & Usability), and White Box/Structural Testing.
S9 apply and support testing at different Test Levels appropriate to the Software Development Lifecycle (such as Unit Testing, Component Integration Testing, System Testing, System Integration Testing and User Acceptance Testing), taking into account the fundamentals of testing
S10 conform to specific industry standards where appropriate (such as GDPR, health informatics, safety critical, etc.) related to software testing.
S11 Maintain up to date knowledge of technological developments in the field of Software Testing.
S12 record and interpret test progress and results, communicating test status to relevant stakeholders
S13 Design and follow tests to achieve coverage criteria.

Behaviours
B1 Maintains a productive, professional and secure working environment
B2 Works independently and takes responsibility. For example, disciplined and responsible approach to risk, works diligently regardless of how much they are being supervised, accepts responsibility for managing their own time and workload and stays motivated and committed when facing challenges
B3 A problem solving mindset within their own remit, being inquisitive and resourceful when faced with a problem to solve. Applies appropriate solutions. ensuring the true root cause of any problem is found and a solution is identified which prevents recurrence.
B6 Works collaboratively with a wide range of people in different roles, internally and externally, with a positive attitude to inclusion & diversity
B7 Communicates effectively in a wide variety of situations; for example, contributing effectively to meetings and presenting complex information to technical and non-technical audiences