ENERGY & UTILITIES
INDEPENDENT
ASSESSMENT SERVICE

EPA Specification Utilities Engineering Technician (AP03)

ENERGY & UTILITIES INDEPENDENT ASSESSMENT SERVICE

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EPA Specification Utilities Engineering Technician

EPA Specification Section 1 – Introduction

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for end-point assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

About the Energy and Utilities Independent Assessment Service (EUIAS)

The EUIAS is an independent end-point assessment organisation (EPAO) approved by the Education and Skills Funding Agency (ESFA) (number EPA0009) to offer and carry out the end-point assessments (EPA) for the Level 3 Utilities Engineering Technician Apprenticeship Standard (ST0159). This specification relates to assessment plan ST0159/AP03.

The EUIAS was established in 2014 and is part of Energy & Utility Skills Limited. The EUIAS delivers rigorous and robust apprenticeship end-point assessment services for the energy and utilities sector, and for technical and safety- critical sectors. In May 2016, The EUIAS became the first end-point assessment provider to have achievers on the English Trailblazer apprenticeship standards.

About End-point Assessment

End-point assessment is the term given to the assessments taken by apprentices at the end of their apprenticeship, and which must be passed in order for the apprentice to be awarded a certificate of achievement. Apprentices must be trained by training providers approved by the ESFA and their end-point assessments must be carried out by an EPAO approved by the ESFA. The assessment is designed, delivered, assessed and quality assured by the EPAO, with further external quality assurance provided by an external quality assurance (EQA) provider.

The EPA typically consists of three assessment components each of which must be passed in order to achieve an overall pass. For the Utilities Engineering Technician standard, the assessments are a multiple-choice test, a practical observation and an interview.

End-point assessment is based on two documents that have been written by an employer group – the Standard and the Assessment Plan, both of which can be found on the website of the Institute for Apprenticeships and Technical Education, www.instituteforapprenticeships.org.

EUIAS designs the assessments to cover the standard, while complying with the assessment plan. It is important for training providers supporting apprenticeships:

- to ensure their training programmes cover all the elements required by the standard
- to have access to suitable premises, plant, machinery and equipment for the practical observation.

How to Use this EPA Specification for Utilities Engineering Technician

Welcome to the EUIAS EPA Specification for the Utilities Engineering Technician (UET) Apprenticeship Standard.

The EUIAS internally quality assures all end-point assessments in accordance with its IQA process and IfATE requirements. This standard is externally quality assured by Ofqual on behalf of the IfATE.

This Specification is available from the EUIAS website (www.euias.co.uk) as a complete document, and also in its individual sections to allow customers to download what they require. **Important: the web site will always contain the latest version of this document so please check back to ensure you are using the latest version.**

This Specification outlines what you need to know about the end-point assessments for this standard and provides details of the on-programme delivery requirements. It provides advice and guidance for trainers on how to prepare apprentices for the end-point assessment.

The Specification provides end-to-end details of the how the EUIAS works with customers, from initial engagement to the completion of end-point assessment.

Audience:

Section 2 will be of interest mainly to the external quality assurance body to ensure the assessment methods cover the standard.

Section 3 will be of interest mainly to administrators and those responsible for planning and scheduling end-point assessments.

Section 4 will be of interest to those ensuring that apprentices have covered all the required elements of the standard during their apprenticeship, and to apprentices themselves.

Sections 5 and 6 will be of interest to those who support apprentices in preparing for the end-point assessments, and to apprentices themselves.

At a glance

Apprenticeship standard: Utilities Engineering Technician

Assessment Plan: ST0159/AP03

QAN: 603/7317/9

Level: 3

On-programme duration: Typically, 48 months

Grading: Fail/pass/distinction

End-point Assessment methods:

- Multiple-Choice Test
- Practical Observation
- Interview supported by a portfolio of evidence which is not directly assessed.

Quality Assurance:

Quality assurance of the end-point assessment is designed in accordance with the Assessment Plan. The main features of EUIAS quality assurance are:

- Assessments carried out by assessors standardised by EUIAS
- Ongoing internal quality assurance
- Moderation and final grading by EUIAS.

External quality assurance is provided by Ofqual on behalf of the IfATE.

In this guide, you will find:

- Detailed amplification and guidance of the standard and guidance on how to prepare the apprentice for gateway
- Detailed information on which part of the standard is assessed by which assessment method
- A section focused on the end-point assessment method where the assessment criteria are presented in a format suitable for carrying out practice assessments
- Suggestions on how to prepare the apprentice for each part of the end-point assessment
- A practice Multiple-Choice Test that you can use with apprentices.

Is this the right standard for you?

The Utilities Engineering Technician standard has been designed by the trailblazer group of employers for technicians carrying out reactive and routine maintenance on equipment to ensure safety and efficiency. Utilities engineering technicians focus on equipment used for **producing and maintaining water supplies**, supporting other disciplines as necessary.

Demonstration of practical skills will be undertaken as work as part of their normal duties which will allow demonstration of Knowledge, Skills and Behaviours through naturally occurring activities rather than simulation.

Purpose

This Utilities Engineering Technician End-point Assessment provides evidence that can be used to show and secure the confidence of others that the apprentice has acquired, the skills, knowledge and understanding which confirms their ability to perform functions of an occupational role to the standards required. It provides evidence of apprenticeship competence, for example, to clients/customers or to their employer to allow them to progress within their career

Standard overview

Utilities Engineering Technicians perform reactive and routine maintenance on equipment to ensure safe and efficient running of the sites, supporting other disciplines as necessary. There are three main roles within the occupation:

- Electrical Technician
- Mechanical Technician
- Instrumentation Control and Automation (ICA) Technician.

All apprentices would be expected in their job role to:

- apply technical knowledge to carry out inspections, condition monitoring and reporting
- follow and comply with industry health and safety and environmental working practices and regulations
- locate, diagnose and rectify faults on plant and equipment
- carry out maintenance activities on a range of waste and water systems, plant and equipment
- use workshop machinery and equipment to create, repair and modify component and apparatus
- carry out and follow planned, reactive, and predictive plant and equipment maintenance procedures
- communicate with and provide information and guidance to contractors, suppliers and colleagues in line with personal role and responsibilities
- handover and confirm completion of engineering activities
- read, understand and interpret computer data and displays, and work to technical specifications and supporting documentation

- adhere to safe working practices and procedures and carry out risk assessments
- carry out safe isolation of equipment, using permit and lock-off systems as required
- drive vehicles equipped with tools and materials to job sites
- install, maintain, replace and commission equipment and components as required
- as required, undertake standby duties to provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures.

Each apprentice would then have additional requirements relating to their particular role (Electrical, Mechanical, ICA). For detail, see Section 3.

On-programme requirements

Apprenticeship candidates will normally have 3 to 5 GCSEs at grades A to C (including mathematics, English), or equivalent qualifications. For Electrical and for Instrumentation, Control and Automation roles a good pass (B or above) in Maths GCSE (or equivalent) is desirable.

The employer or training provider should ensure that they have developed and can deliver a programme of training and learning that will enable the apprentice to develop the knowledge, skills and behaviours that will be assessed as part of this standard. The programme must cover all the knowledge, skills and behaviours of the standard.

The planning, organisation and delivery of the on-programme element of the apprenticeship is the responsibility of the employer or training provider and it is their responsibility to ensure they are compliant with all applicable regulations.

The programme of training for the Utilities Engineering Technician must be completed before being entering gateway and must include English and Maths at Level 2 (or equivalent). If not already held.

For all roles it is recommended that throughout the period of learning and development, and at least monthly' the apprentice should meet with their training provider or employer to record their progress against the standard. At these reviews, the employer should:

- set learning and development goals
- track the apprentice's progress
- coordinate 20% of the apprentice's time being spent in off-the-job training.

The employer must satisfy themselves that the apprentice:

- has developed and demonstrated the knowledge, skills and behaviours as specified in the standard
- can successfully demonstrate their ability to work safely and competently as a Utilities Engineering Technician.

Once the apprentice is deemed competent, the relevant section(s) of the standard should be signed off by the on-programme assessor and employer.

Readiness for end-point assessment

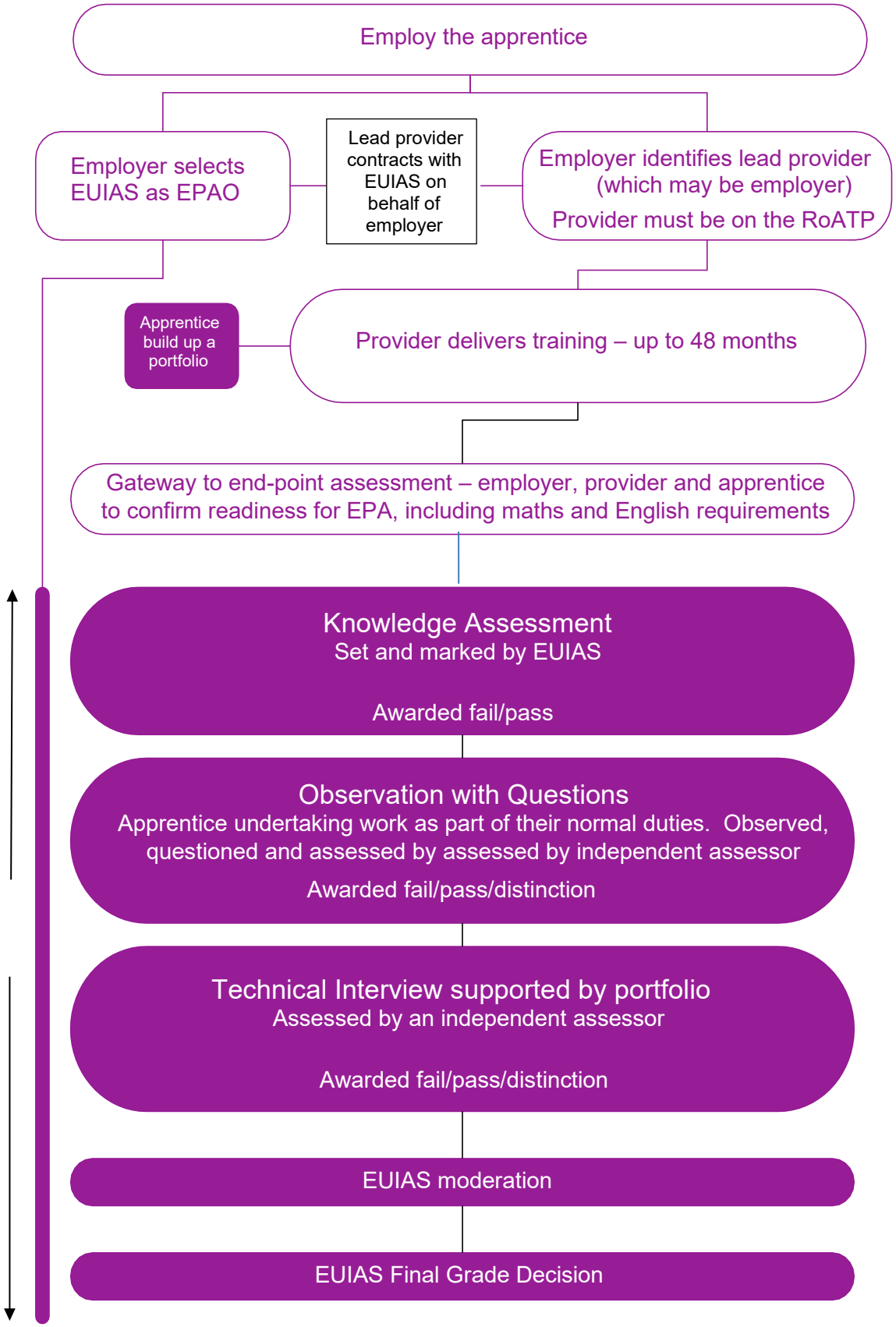
The apprentice must satisfy all requirements of the final gateway before entering end-point

assessment:

- Achievement of Level 2 English and maths; EUIAS requires copies of the certificates before end-point assessment can take place
- The employer, training provider and apprentice must be confident that the apprentice has developed all the knowledge, skills and behaviours defined in the apprenticeship standard. To ensure this, the apprentice must attend a formal meeting with their employer to complete the Gateway Eligibility Report
- The apprentice and the employer must engage with the Service Delivery team at EUIAS to agree a schedule for each assessment activity to ensure all components can be completed within a 6-month assessment window. Further information about the gateway process in Section 3
- The employer, training provider and apprentice must be confident in ensuring that all EPA assessment completed documentation is uploaded to the EUIAS system as instructed by the Service Delivery Team
- The evidence portfolio must be completed and available for review at the Interview; it should be made available to EUIAS for review 2 weeks before the interview

Order of end-point assessments

There is no prescribed order in which the assessments must take place. EUIAS recommend that the Multiple-Choice Test is completed first and the Interview completed last.



Overview of the EPA process – EPA related activities in purple

EPA Specification Utilities Engineering Technician

EPA Specification Section 2 – Mapping the Standard

Contacts

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Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

Purpose

The purpose of this section is to introduce the elements of the standard and the referencing system used by the EUIAS. It provides and 'at-a-glance' view of which parts of the standard are assessed by which assessment method.

The Standard

The standard is divided into core Knowledge, Skills and Behaviours, plus specialist related skills.

- Core Knowledge (K)
- Core Skills (S)
- Core Behaviours (B)
- Specific Skills (E, M or I)

The Knowledge, Skills and Behaviours statements are assessed in the end-point assessment methods as follows:

Core Knowledge	The Technician will	Multiple-Choice Test	Observation	Interview
K1	Relevant industry health and safety standards and regulations, and environmental and regulatory requirements	✓		
K2	Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment		✓	
K3	Relevant level of theory and principles that underpin the design and function of electro-mechanical and instrumentation systems and equipment	✓		
K4	Principles and processes that underpin the location, diagnosis and rectification of faults			✓
K5	Planned, reactive, and predictive maintenance processes, practices and procedures		✓	

Core Skill	The Technician will	Multiple-Choice Test	Observation	Interview
S1	Apply technical knowledge to carry out inspections, condition monitoring and reporting			✓
S2	Follow and comply with industry health and safety and environmental working practices and regulations		✓	
S3	Locate, diagnose and rectify faults on plant and equipment			✓
S4	Carry out maintenance activities on a range of waste and water systems, plant and equipment		✓	
S5	Use workshop machinery and equipment to create, repair and modify component and apparatus			✓
S6	Carry out and follow planned, reactive, and predictive plant and equipment maintenance procedures		✓	
S7i	Communicate with and provide information and guidance to colleagues in line with personal role and responsibilities		✓	
S7ii	Communicate with and provide information and guidance to contractors in line with personal role and responsibilities			✓
S8	Handover and confirm completion of engineering activities		✓	
S9i	Read, understand and interpret computer data and displays	✓		
S9ii	Work to technical specifications and supporting documentation		✓	

Core Skill	The Technician will	Multiple-Choice Test	Observation	Interview
S10	Adhere to safe working practices and procedures and carry out risk assessments		✓	
S11	Carry out safe isolation of equipment, using permit and lock-off systems as required		✓	
S12	Drive vehicles equipped with tools and materials to job sites			✓
S13i	Maintain equipment and components as required		✓	
S13ii	Install, replace and commission equipment and components as required			✓
S14	As required, undertake standby duties to provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures			✓

Core Behaviours	The Technician will	Multiple-Choice Test	Observation	Interview
B1	Display a self-disciplined, self-motivated approach whilst recognising personal limitations and seeking advice from fact holders and specialists when required		✓	
B2	Accept responsibility for work of self or others		✓	
B3	Deliver a polite, courteous professional service to customers and members of the public			✓
B4i	Work effectively and safely when undertaking tasks to approved standards and safe working practices when working alone		✓	
B4ii	Work effectively and safely when undertaking tasks to approved standards and safe working practices as part of a team or with appropriate supervision			✓

Core Behaviours	The Technician will	Multiple-Choice Test	Observation	Interview
B5	Undertake and complete work in a way that contributes to sustainable development		✓	
B6	Be risk aware and minimise risks to life, property and the environment when undertaking work activities		✓	
B7i	Be quality focussed.		✓	
B7ii	Be professional in work and in personal standards			✓
B8	Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact		✓	
B9	Accept, allocate and supervise technical and other tasks			✓
B10	Be aware of the needs and concerns of others, especially where related to diversity and equality			✓
B11	Carry out and record CPD necessary to maintain and enhance competence			✓
B12	Exercise responsibilities in an ethical manner			✓

Specific Skills - Electrical

Specific Skill	The Technician will	Multiple-Choice Test	Observation	Interview
E1	Inspect and monitor electrical systems, and inspect, monitor, maintain and repair electrical equipment			✓
E2	Test electrical equipment and systems and assist in installing electrical systems and equipment			✓
E3	Access a range of sites to install, maintain, test, repair and dismantle electrical equipment			✓
E4	Use electrical theories and principles to use test equipment for voltage, current and earth resistance testing to maintain the integrity of the electrical system		✓	
E5	Consult design specifications to analyse and calculate electrical system parameters and rectification procedures.			✓
E6	Interpret electrical drawings to install, position or re-locate electrical equipment and cabling.			✓
E7	Test, service and repair electrical equipment as part of planned preventative maintenance and/or reactive maintenance programmes			✓
E8	Install and connect electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment.			✓
E9	Carry out electrical procedures on industrial low voltage systems (up to 1000V AC) operating switchgear, fuses, motor control centres, transformers, manual & automatically controlled drives and motors.		✓	
E10	Carry out basic fault diagnostics on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems.			✓

Specific Skills – Mechanical

Specific Skill	The Technician will	Multiple-Choice Test	Observation	Interview
M1	Apply mechanical theories and principles in order to carry out diagnostic fault finding procedures			✓
M2i	Inspect and monitor mechanical systems, and maintain mechanical equipment and components		✓	
M2ii	Inspect and monitor mechanical systems, and inspect, monitor, dismantle and repair mechanical equipment and components			✓
M3	Test mechanical equipment and systems and assist in installing mechanical systems and equipment			✓
M4	Basic Fabrication and welding of structures and components			✓
M5	Use mechanical knowledge and skills to install, maintain and dismantle a wide range of complex plant, machinery and components			✓
M6	Consult design specifications to analyse and calculate mechanical system parameters and rectification procedures.			✓
M7	Interpret plans and drawings to install, position or re-locate mechanical equipment and components.			✓
M8i	Test, service mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes		✓	
M8ii	Repair mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes			✓

Specific Skill	The Technician will	Multiple-Choice Test	Observation	Interview
M9	Install and maintain mechanical components including motors, pumps and gearboxes, maintaining and replacing lubricants.			✓
M10	Inspect and maintain condition monitoring equipment			✓

Specific Skills – Instrumentation Control and Automation

Specific Skill	The Technician will	Multiple-Choice Test	Observation	Interview
I1	Apply theories and principles of electronics to use equipment to carry out diagnostic fault finding procedures			✓
I2i	Maintain instrumentation and control equipment and circuits		✓	
I2ii	Repair and overhaul instrumentation and control equipment			✓
I3	Test and Calibrate Instrumentation and control equipment and circuits, and assist in installing instrumentation and control equipment			✓
I4i	Use Instrumentation and Control Systems knowledge and skills to maintain instruments, controllers, probes, attachments, cabling, meters and display units		✓	
I4ii	Use Instrumentation and Control Systems knowledge and skills to install and dismantle instruments, controllers, probes, attachments, cabling, meters and display units			✓
I5	Carry out telemetry outstation and internal system configuration			✓
I6	Identify and resolve data quality and calibration issues			✓

Specific Skill	The Technician will	Multiple-Choice Test	Observation	Interview
I7	Test, calibrate and validate fixed and portable analogue and digital instrumentation using approved procedures and standards.		✓	
I8i	Maintain and calibrate field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems		✓	
I8ii	Repair and configure field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems			✓
I9	Use standards and specifications to improve the information gathered by telemetry data			✓
I10	Inspect and maintain security equipment, telecommunication devices and alarm systems			✓
I11	Carry out isolation procedures to ensure process or system stability and personnel safety when carrying out operations		✓	
I12	Provide support to day-to-day users of instrumentation and control systems			✓
I13	Complete data cleansing to ensure consistent and valid data is available for business and regulation purposes			✓

EPA Specification Utilities Engineering Technician

EPA Specification Section 3 – Service Delivery and Gateway Eligibility

- EUIAS Service Delivery
- How to prepare for gateway
- The Gateway meeting
- Timeline

Contacts

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Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

EUIAS Service Delivery

Whether you are an employer or a training provider (or both) your initial engagement will probably be with a business development manager who will introduce you to this document and take you through the EPA service that we offer. Our aim is to make the experience as straightforward and easy to engage with as possible.

The key to a successful EPA experience is early identification of requirements to enable proper planning to take place and this section explains the requirements for preparing for the Utilities Engineering Technician EPA.

> All the requirements discussed below are important, but some of them are critical, in particular the Gateway Eligibility Requirements. It is important to note that the end-point assessments cannot proceed without the Gateway Eligibility requirements being met. A completed Gateway Eligibility Report with supporting documents is required for each apprentice before EPA.

The EPA Window

All end-point assessments have a 'window' during which the end-point assessment must be completed, to avoid apprentices 'timing out'. The EPA period for the UET standard will be typically three months. The EPA window for each apprentice commences on the date they take the first element of their EPA, for example, the day of the Multiple-Choice Test.

All EPA activities must be completed within this 3-month window and EUIAS will work with you to schedule the EPA as close to the beginning of the window as possible to allow for re-sits if necessary.

The assessments can be delivered in any order, and the result of one does not need to be known before starting the next.

Service Level Agreement (SLA) and Cohort Registration Form

EUIAS uses two documents to capture the details of the end-point assessment agreement:

- Service Level Agreement form – signed by provider
- Cohort Registration form – signed by provider; this form identifies the apprentices in the cohort

The Cohort Registration Form includes a section where the employer formally appoints the EUIAS as their end-point assessment organisation for the named apprentices.

Initial Engagement

Initial engagement with EUIAS will usually take place well before the EPA is due to take place and sometimes before the apprentices start their programme. The initial engagement meeting will cover:

- The number of apprentices in the cohort
- Any Reasonable Adjustments you want to apply for
- The relevant specialist pathway: it is very important that this apprenticeship, and the pathway within it, is the right one for your requirements. The apprentice will be assessed against the requirements of the standard and not what they actually do within their job role
- The expected date(s) of EPA
- The employer or lead provider for each apprentice
- Completion of the Service Level Agreement
- The Multiple-Choice Test – where it will take place and who will invigilate
- The Interview – where it will take place and how the portfolios will be shared with EUIAS
- Compiling the portfolio of evidence that is reviewed during the Interview – what to put in the portfolio and how to signpost it

Further details of the assessment methods are in Section 5 of this EPA Specification.

The EUIAS operates a two-stage payment schedule:

- Stage One applies at the registration stage when the initial registration fee is due.
- Stage Two applies at Gateway, when the balance of the agreed fee is due.

During the initial engagement, we will also cover the support that is available for the employers and or training providers. We are confident that most, if not all the answers you need are contained within this Specification, but we are always available to provide answers to specific queries using the Help Desk email enquiries@euias.co.uk

Appointment and Registration

The appointment stage is the first formal stage of working with EUIAS. This stage must involve both the employer and the training provider (if applicable).

Successful appointment involves the completion of Cohort Registration Form, officially appointing EUIAS as the EPAO for this cohort. The form contains all the following:

- Details of the training provider (if applicable)
- Confirmation of learner numbers and specialist pathways
- Confirmation of expected EPA dates
- Confirmation of the level of service agreed with EUIAS, with pricing
- Confirmation that you will give a minimum of three months' notice of apprentices being ready for EPA (especially important if you bring forward the completion date)
- Signatures from both the employer and the training provider (if applicable)
- Completion of the Learner Submission form listing each learner in the cohort

- A purchase order from the lead-provider to EUIAS to the value agreed

If it has not already taken place, the details of the EPA will be discussed (as described in the Initial Engagement Section above) with the employer and training provider (if applicable) to agree roles and responsibilities.

On Programme

It is the responsibility of the training provider to create and deliver the apprentice training programme, ensuring you comply with the relevant ESFA rules. The EUIAS has no formal involvement in the 'on-programme' aspect of the apprenticeship. However, we DO provide guidance on how to put together the portfolio that is required for the Interview. This can be found in Section 5.

We do appreciate that circumstances change so please notify us if:

- expected end-dates change, giving at least three months' notice of readiness for end-point assessment
- any cohort details change, especially if an apprentice drops off the programme
- any anticipated changes in venues for the end-point assessments.

Scheduling the end-point assessment

The EPA for UET is very resource intensive, both in terms of availability of specialist settings for the Practical observation and in terms of availability of the specialist assessors that are required. The apprentices must be available for all assessments. Employer, training provider and EUIAS must keep in touch and notify each other of any changes as soon as they occur.

To help things run smoothly, you must inform EUIAS between 3 and 6 months before you expect to have your Gateway meetings with the cohort. The EUIAS Service Delivery team will be contacting you during this time, to facilitate two-way communication. Your proposed EPA date may be sooner than was originally anticipated at the time of registration, which is OK so long as the apprentice(s) has been on programme for at least a year.

We cannot confirm any EPA arrangements until we have confirmation of Gateway Eligibility Report, as discussed in the next section, but we will put together a provisional plan and share it with you. As a customer, you probably want to confirm Gateway Eligibility Report on one day and have the first end-point assessments the next day. The reality is that scheduling takes time and can take varying periods of time. The early notification helps us put together a provisional schedule, but we can only confirm it after Gateway Eligibility Report requirements are all met. The fewer changes you make to the information you give us three months before Gateway, the sooner it will be before we can start the EPA. We too commit to making last-minute changes as rare as possible.

We always aim to accommodate your requirements when scheduling, taking account of availability of apprentices, location and availability of assessment venues, availability of assessors and also ensuring that we have evidence of the pre-requisites, in particular level 2 English and mathematics.

As soon as possible after Gateway, EUIAS will confirm with you the end-point assessment

arrangements for each apprentice in the cohort.

We will always try to schedule as soon as possible within the 6-month window, to allow time for any re-sits before the window closes.

How to prepare for Gateway

On completion of their on-programme learning apprentices should be ready to pass through 'gateway' to their end-point assessment.

At this point, the employer, training provider and apprentice should hold a Gateway Eligibility meeting. The purpose of this meeting is to confirm that all parties agree the apprentice has met the requirements of the apprenticeship standard and is ready for end-point assessment. Note that the EUIAS is NOT present at this meeting. It is your sole responsibility to assure yourself, along with the training provider (if applicable) that the apprentice is ready for end-point assessment.

You are advised that the apprentice should prepare for this meeting by bringing along work-based evidence, including:

- portfolio of evidence
- mid and end-of-year performance reviews
- feedback to show how they have met the apprenticeship standard during the on-programme:

Before the meeting, apprentices must have achieved:

- Level 2 English
- Level 2 maths.

Apprentices should be advised by employers and providers to gather this evidence throughout their on-programme training, copies or scans of certificates WILL be required by EUIAS before the apprentice can start EPA. Typically, these will be functional skills qualifications at Level 2 or GCSEs at grade C or above, or grade 4 and above.

It is recommended that employers and providers complete regular checks and reviews of this evidence to ensure the apprentice is progressing and achieving the standards before the gateway meeting is arranged.

Employers must satisfy themselves that apprentices are ready for their end-point assessment, which is evidenced by the apprentice consistently working at, or above, the level set out in the occupational standard.

The Gateway meeting

To comply with end-point assessment rules, EUIAS is not present at the Gateway meeting. Ideally it would be conducted with the apprentice, training provider and the employer present. Gateway meetings last about an hour and are completed on or after the apprenticeship on-programme end date. It should be attended by the apprentice and the relevant people who have worked with the apprentice on-programme, such as the line manager/employer or mentor and the on-programme trainer/training provider.

During the meeting, the apprentice, employer and training provider will discuss the different

aspects of the apprenticeship standard and confirm that the apprentice has met the full criteria of the apprenticeship standard during their on-programme training. A copy of standard and the latest version assessment plan (ST0159/AP03) should be available at the meeting. This can be accessed via the link below:

https://www.instituteforapprenticeships.org/media/4226/st0159_utilities-engineering-technician_l3_ap-for-publication_170420.pdf

In addition, the apprentice should be informed that EUIAS will be conducting the end-point assessment and that copies of the following policies are available on the EUIAS web site at www.euias.co.uk :

- appeals policy
- complaints policy

A full list of EUIAS policies can be accessed via the link below:

https://www.euias.co.uk/end-point-assessment/policies/

At the meeting, the apprentice should be informed that they are required to have proof of their identity with them for each end-point assessment element. EUIAS will accept the following as proof of identity:

- a valid passport
- a UK driving licence
- a valid warrant card issued by HM forces or uniformed services
- other photographic ID card such as an employee ID card or travel card.

At the meeting, the Gateway Eligibility Report (GER) must be completed, agreed and signed by all 3 parties* and submitted to EUIAS at enquiries@euias.co.uk with the subject line "GER – apprentice name – provider name".

A completed GER form is required for every apprentice entered for end-point assessment.

*Where possible. We recognise that some meetings will take place at distance in which case an email agreement from the apprentice should be appended to the GER form.

The Gateway Eligibility Report is a requirement of EUIAS. If it is not possible to have the employer present at the time the Gateway Eligibility Form is completed by the apprentice and training provider, EUIAS will contact the employer to gain their signature.

Reasonable adjustments

If you wish to apply for reasonable adjustments on behalf of any of your apprentices, please do so at the same time as submitting the GER form, using the EUIAS Reasonable Adjustment Policy and Application that can be found at www.euias.co.uk. This can also be directly accessed via link below

https://www.euias.co.uk/wp-content/uploads/2020/07/Reasonable-Adjustments-Policy-and-Application-v5.0.pdf

Re-sits and Re-takes

Apprentices who fail one or more assessment method will be offered the opportunity to take a resit or a re-take at the employer's discretion.

The apprentice's employer will need to agree that either a resit or re-take is an appropriate course of action. A resit does not require further learning, whereas a re-take does.

Apprentices should have a supportive action plan to prepare for a resit 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 resit or re-take the failed assessment method(s) only.

The timescales for a resit/re-take is agreed between the employer and EPAO. A resit 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 resat/re-taken.

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

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

EUIAS resit and re-take policy can be found at www.euias.co.uk. This can also be directly accessed via link below

https://www.euias.co.uk/wp-content/uploads/2020/02/Re-sit-and-Re-take-Policy-v5.0.pdf

Timeline

Typical timeline in months, before and after the Gateway.

Initial engagement - 48 months before Gateway

Initial engagement, informal meeting between EUIAS and to agree:

- The numbers of apprentices in the cohort
- Any Reasonable Adjustments you want to apply for
- The relevant specialist pathways
- Expected location(s) for the Observation with questions
- The expected date(s) of EPA
- The Training Provider (TP)
- The payment schedule
- Completion of Service Level Agreement (employer AND lead provider)

Registration - 48 months before Gateway to 6 months before Gateway

The apprentice is on-programme, and compiling their portfolio of evidence to support the Interview

Formal Appointment/registration using the Cohort Registration form (Triggers Stage 1 payment) EUIAS:

- EUIAS will issue the Privacy Notice which must be shared with every apprentice in the cohort

Employer and training provider:

- Confirmation of expected EPA dates
- Confirmation of the level of service agreed with EUIAS, with pricing
- Confirmation that you will give three months' notice of apprentices being ready for EPA
- Completion of the Learner Submission form including each learner in the cohort
- Update calls (as agreed)
- EUIAS will periodically call designated contact to enquire about progress towards EPA
- EUIAS provides on-going support via enquiries@euias.co.uk
- Employer or training provider will give at least 6 months' notice of any proposed change to EPA dates

6 months before Gateway to Gateway

- Employer or training provider provides details of practical Observation to EUIAS i.e. venue, type of plant/equipment, which specialist skills to be covered by each apprentice

3 months before Gateway to Gateway

- Employer or training provider to compile evidence of meeting eligibility requirements (Level 2 English and maths)
- Employer or training provider should also be arranging practice assessments for apprentices
- Complete the Cohort Registration form, signed jointly by employer and TP, with:
- Confirmation of learner numbers and specialist pathways

Gateway

Employer and training provider:

- Provide completed Gateway Eligibility Report for each apprentice
- Ensure ALL eligibility requirements are met for each apprentice going forward to EPA
- Purchase order for Stage 2 payments

Gateway, and the typically 3-month EPA window

End-point Assessment window (NB. 3-month window for each apprentice commences on the date of their first EPA activity)

The assessments can be undertaken in any order, but we strongly recommend the Multiple-Choice Test is carried out first. Our pricing is based on being able to test every apprentice in the cohort at the same time (Multiple-Choice Test).

EUIAS:

- Schedule the assessments, in discussion with the employer/training provider
- Provides assessors for all assessment activities (unless otherwise agreed)
- Provides invigilator for Multiple-Choice Test (if agreed in the price)
- Arranges re-sits within 6 months of the start of EPA activity, if required
- Carries out a final moderation to confirm grading decisions
- Will provide results of EPA with 11 days of final moderation

Employer or training provider:

- Ensures apprentices are briefed and prepared for EPA, including location and timings of assessments
- Provides venue for the Multiple-Choice Test (and re-sits if required)
- Provides access and details of venue for practical observation, as previously agreed with EUIAS
- Provide EUIAS with the completed apprentice portfolios to support the interview

NB. A re-take will be arranged, with the agreement of all parties, for apprentices who have failed a element or elements and are deemed to require further training before being ready for end-point assessment.

Time-line summary for Employers and training provider; refer to previous section for details

48 months before Gateway

- Complete SLA (employer and provider) and Learner submission form
- Completion of Employer Appointment and Cohort Registration form
- Raise purchase order for registration fees (Stage 1 payment)

6 months before Gateway

- Notify EUIAS of any changes to EPA dates
- Confirm arrangements for the practical Observation with EUIAS
- Apprentices completing their portfolio

3 months before Gateway

- Employer/training provider compiling eligibility documents (English/maths) for all apprentices
- Carry out practice assessments with apprentices

Gateway

- Gateway meeting between apprentice, provider and employer to confirm Gateway readiness
- Return completed Gateway Eligibility Report, with required documentation, to EUIAS, one per apprentice

The 3 month EPA window

- Ensure apprentices are available for their EPA activities
- Provide EUIAS with apprentice portfolios 2 weeks before interview
- Multiple-Choice Test is usually first

EPA Specification Section 4 – Utilities Engineering Technician Standard with Amplification and Guidance

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for end-point assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

The Utilities Engineering Technician standard in detail

The Utilities Engineering Technician consists of:

- Core knowledge (5 elements)
- Core skills (14 elements)
- Behaviours (12 elements)
- Specific skills (10 elements for Electrical, 10 for Mechanical and 13 for Instrumentation Control and Automation)

The following pages list each of the elements of the standard and additional amplification and guidance from EUIAS on the range and depth expected.

Core Knowledge
Assessed in Multiple Choice Test
Knowledge K1 Relevant industry health and safety standards and regulations, and environmental and regulatory requirements K3 Relevant level of theory and principles that underpin the design and function of electro-mechanical and instrumentation systems and equipment **Skills** S9i. Read, understand and interpret computer data and displays

Core Knowledge: Amplification and Guidance
Assessed in Multiple Choice Test
K1 Relevant industry health and safety standards and regulations, and environmental and regulatory requirements
To include • Health and Safety: The Health and Safety at Work Act; The Management of Health and Safety at Work Regulations; Provision and Use of Work Equipment Regulations; The Electricity at Work Regulations; Workplace (Health and Safety and Welfare) Regulations; COMAH; Control of Substances Hazardous to Health (COSHH); RIDDOR • Environment: Environmental Protection Act; Control of Asbestos at Work Regulations; The Hazardous Waste Regulations; Pollution Prevention and Control Act; Control of Pollution Act; The Control of Noise at Work Regulations; The Waste Electrical and Electronic Equipment Regulations • Personal Protective Equipment (PPE) • Manual Handling • Working at Height • Awareness of Confined Space • Awareness of Permit to Work • Warning signs for the main groups of hazardous substances: COSHH, CLP, ISO • Roles and responsibilities of employers and employees with regard to current relevant protection of health, safety and the environment in the workplace • The meaning of the term 'risk' and how to rate the level of risk in the workplace

Core Knowledge: Amplification and Guidance
Assessed in Multiple Choice Test
• The meaning of the term 'hazard' and how to identify specific hazards associated with maintenance and operations • Company practices and procedures for addressing hazards, accidents and emergencies; appropriate responsible persons; RIDDOR; first aid; handling, maintenance and storage of tools, equipment and materials; safe working practices; isolation and locking-off procedures
K3 Relevant level of theory and principles that underpin the design and function of electro-mechanical and instrumentation systems and equipment
• For **all** pathways to include • Engineering mathematics: ▪ appropriate degree of accuracy ▪ use formulae and algebraic expressions to solve problems ▪ use Sine, Cosine and Tangent to solve typical engineering problems ▪ apply Pythagoras' Theorem • Engineering theories & principals: ▪ energy: electrical; kinetic (rotational and linear movement); potential; heat; chemical ▪ primary units of the SI system: length, mass, time, temperature ▪ derived units of the SI system: force, stress, density, conductivity, power, capacity • Common engineering materials: ▪ characteristics of metallic and non-metallic materials used in engineering

Core Knowledge: Amplification and Guidance

Assessed in Multiple Choice Test

- causes of corrosion in materials
- defects that can occur in materials/products
- select materials to meet specification requirements in a typical engineering environment

- Quality control:
  - understand quality control in function and maintenance of equipment
  - making recommendations whether to re-work, adjust or scrap items/components that do not meet required standards
  - basic principles of document control
  - the importance of quality records and the type of inspection records needed
- Engineering information:
  - extract information from drawings
  - abbreviations and notation used on various standard engineering drawings
  - interpret the information that can be extracted from reference charts, tables, graphs and BS EN standards
  - interpret drawings and labelling
  - use charts, tables, graphs and BS EN standards

To include for individual pathways

- Electrical
  - Equipment: switchgear, circuit breakers, motors, transformers, motor control centres, drive mechanisms
  - Engineering mathematics: calculations involving power, electromotive force and resistance
  - Engineering theories & principals: basic electrical principles

Core Knowledge: Amplification and Guidance
Assessed in Multiple Choice Test
• ICA ▪ Equipment: SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner ▪ Engineering mathematics: calculations involving power, voltage, current ▪ Engineering theories & principals: theory of analogue and digital systems, basic principles of digital monitoring, basic principles of instrumentation for process monitoring and control • Mechanical ▪ Equipment: bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening ▪ Engineering mathematics: calculations involving forces, friction, work done and power ▪ Engineering theories & principals: work and power transmission; laws of friction; the relationship between temperature changes and changes in length; define moments of a force
S9i Read, understand and interpret computer data and displays.
• Data from systems including ▪ flow statistics ▪ pH

Core Knowledge: Amplification and Guidance
Assessed in Multiple Choice Test
▪ dissolved oxygen (DO) measurements ▪ air flows ▪ turbidity ▪ chemical concentrations • Interpretation to include ▪ process performance – within acceptable parameters or not ▪ identification of faults and problems ▪ compliance with relevant standards

Core Skills
Assessed in Practical Observation with Questions
Knowledge K2. Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment K5. Planned, reactive, and predictive maintenance processes, practices and procedures **Skills** S2. Follow and comply with industry health and safety and environmental working practices and regulations S4. Carry out maintenance activities on a range of waste and water systems, plant and equipment S6. Carry out and follow planned, reactive and predictive plant and equipment maintenance procedures S7i. Communicate with and provide information and guidance to colleagues in line with personal role and responsibilities S8. Handover and confirm completion of engineering activities S9ii. Work to technical specifications and supporting documentation S10. Adhere to safe working practices and procedures and carry out risk assessments S11. Carry out safe isolation of equipment, using permit and lock-off systems as required S13i. Maintain equipment and components as required **Behaviours** B1. Display a self-disciplined, self-motivated approach whilst recognising personal limitations and seeking advice from fact holders and specialists when required B2. Accept responsibility for work of self or others B4i. Work effectively and safely when undertaking tasks to approved standards and safe working practices when working alone B5. Undertake and complete work in a way that contributes to sustainable development B6. Be risk aware and minimise risks to life, property and the environment when undertaking work activities B7i. Be quality focused B8. Identify, organise and use resources effectively to complete

Specific Skills
Assessed in Practical Observation with Questions
Electrical E4. Use electrical theories and principles to use test equipment for voltage, current and earth resistance testing to maintain the integrity of the electrical system. E9. Carry out electrical procedures on industrial low voltage systems (up to 1000V AC) operating switchgear, fuses, motor control centres, transformers, manual & automatically controlled drives and motors.
Mechanical M2i. Inspect and monitor mechanical systems and maintain mechanical equipment and components. M8i. Test and service mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.
Instrumentation Control and Automation I2i. Maintain instrumentation and control equipment and circuits. I4i. Use Instrumentation and Control Systems knowledge and skills to maintain instruments, controllers, probes, attachments, cabling, meters and display units. I7. Test, calibrate and validate fixed and portable analogue and digital instrumentation using approved procedures and standards. I8i. Maintain and calibrate field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems. I11. Carry out isolation procedures to ensure process or system stability and personnel safety when carrying out operations.

Core Skills: Amplification and Guidance
Assessed in Practical Observation with questions: All pathways
K2. **Maintenance practices**, **processes** and **procedures** covering a range of waste and water systems, plant and equipment K5. Planned, reactive, and predictive **maintenance processes, practices** and **procedures** S4. Carry out **maintenance activities** on a **range of waste and water systems, plant and equipment** S6. Carry out and follow planned, reactive and predictive plant and equipment **maintenance procedures**
Maintenance practices, processes and procedures, depending on pathway, to include • Water treatment processes (water dosing, filtration, disinfection) • Maintenance of plant and equipment within the utilities sector • RAMS (Risk Assessment and Method Statements) • Operate control and maintain process control equipment and instrumentation **Range of waste and water systems, plant and equipment** such as, but not limited to • Electrical equipment: switchgear, circuit breakers, motors, transformers, motor control centres, drive mechanisms • ICA equipment: SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner • Mechanical equipment: Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening

Core Skills: Amplification and Guidance
Assessed in Practical Observation with questions: All pathways
components, chemical dosing equipment
S2. Follow and comply with industry health and safety and environmental **working practices and regulations** S10. Adhere to safe **working practices and procedures** and carry out risk assessments
Working practices and regulations / working practices and procedures such as but not limited to • Health and Safety: The Health and Safety at Work Act; The Management of Health and Safety at Work Regulations; Provision and Use of Work Equipment Regulations; The Electricity at Work Regulations; Workplace (Health and Safety and Welfare) Regulations; COMAH; Control of Substances Hazardous to Health (COSHH); RIDDOR • Environment: Environmental Protection Act; Control of Asbestos at Work Regulations; The Hazardous Waste Regulations; Pollution Prevention and Control Act; Control of Pollution Act; The Control of Noise at Work Regulations; The Waste Electrical and Electronic Equipment Regulations • Personal Protective Equipment (PPE) • Awareness of Confined Space • Warning signs for the main groups of hazardous substances • Roles and responsibilities of employers and employees with regard to current relevant protection of health, safety and the environment in the workplace • The meaning of the term 'risk' and how to rate the level of risk in the workplace • The meaning of the term 'hazard' and how to identify specific hazards associated with maintenance and operations

Core Skills: Amplification and Guidance
Assessed in Practical Observation with questions: All pathways
• Company practices and procedures for addressing hazards, accidents and emergencies; appropriate responsible persons; RIDDOR; first aid; handling, maintenance and storage of tools, equipment and materials **Safe working practices,** such as, but not limited to • isolation and locking-off procedures • RAMS – as above • Permits to work • Hot works permit
S7i. **Communicate with and provide information and guidance** to colleagues in line with personal role and responsibilities
Communicate with and provide information and guidance • Provision of accurate verbal and written reports in line with company policy and procedures • A polite and courteous service to relevant people
S8. **Handover** and confirm completion of **engineering activities**
Handover to include • chain of command

Core Skills: Amplification and Guidance
Assessed in Practical Observation with questions: All pathways
• Verbal handovers • Written handovers • Handover documentation • Correct sign-off procedure **Engineering activities** • Maintenance procedures • Operation and control of process equipment • Inspection and testing of equipment (electrical, mechanical and instrumentation)
S9ii. Work to **technical specifications** and **supporting documentation**
Technical specifications • RAMS (Risk Assessment Method Statements) • Operational manuals • Manufacturers data sheet • Commissioning reports

Core Skills: Amplification and Guidance
Assessed in Practical Observation with questions: All pathways
Supporting documentation • Company recording and reporting documents
S11. Carry out **safe isolation** of equipment, using **permit** and l**ock-off systems** as required
• Safely isolate equipment from all sources of energy
S13i. Maintain **equipment** and **components** as required
Range of equipment and components such as but not limited to • Electrical equipment: switchgear, circuit breakers, motors, transformers, motor control centres, drive mechanisms, LV (low voltage) ELV (extra low voltage) circuits • ICA equipment: SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner • Mechanical equipment: Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening

Core Skills: Amplification and Guidance
Assessed in Practical Observation with questions: All pathways
components, chemical dosing equipment
Behaviours B1. Display a self-disciplined, self-motivated approach whilst recognising personal limitations and seeking advice from fact holders and specialists when required B2. Accept responsibility for work of self or others B4i. Work effectively and safely when undertaking tasks to approved standards and safe working practices when working alone B5. Undertake and complete work in a way that contributes to sustainable development B6. Be risk aware and minimise risks to life, property and the environment when undertaking work activities B7i. Be quality focused B8. Identify, organise and use resources effectively to complete

Specific Skills: Amplification and Guidance
Assessed in Practical Observation with Questions: Electrical
E4. Use **electrical theories and principles** to use test equipment for voltage, current and earth resistance testing to maintain the integrity of the electrical system
Electrical theories and principles such as, but not limited to • Ohms Law • Watt's Law • Fleming / left hand right hand rule • Single phase power • Three phase power • Frequency
E9. Carry out **electrical procedures** on industrial low voltage systems (up to 1000V AC) operating switchgear, fuses, motor control centres, transformers, manual & automatically controlled drives and motors
Electrical procedures • Start up and shutdown • Safe isolations • Handover • Fault finding

- Planned and reactive maintenance
- Inspection and testing
- Visual inspections
- Sensory perception: smell touch sight sound

Specific Skills: Amplification and Guidance

Assessed in Practical Observation with Questions: Mechanical

M2i. Inspect and monitor **mechanical systems** and maintain **mechanical equipment and components**
M8i. Test and service **mechanical equipment** as part of planned preventative maintenance and/or reactive maintenance programmes

Mechanical systems / mechanical equipment and components such as, but not limited to

- Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches
- Pumping systems
- Aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters
- Actuators, blowers, compressors, air absorption vessels, air receivers
- Inlet and screening components
- Chemical dosing equipment

Specific Skills: Amplification and Guidance
Assessed in Practical Observation with Questions: **Instrumentation Control and Automation**
I2i. Maintain **instrumentation and control equipment** and circuits I4i. Use Instrumentation and Control Systems knowledge and skills to maintain **instruments**, controllers, probes, attachments, cabling, meters and display units
Instrumentation and control equipment / instruments, such as but not limited • SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner
I7. Test, calibrate and validate fixed and portable **analogue and digital instrumentation** using approved procedures and standards I8i. Maintain and calibrate field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems
Analogue and digital instrumentation • Level measurement devices such as transmitters, switches, displacement, RF Probe, ultrasonic • Flow measurement devices such as transmitters, switches, turbine, magmeter, ultrasonic, rotameters and differential pressure devices eg Venturi, Dall tube, Orifice plate, pitot tube • Analytical instruments such as gas detection, turbidity, dissolved oxygen • Digital sensors including proximity, electro-magnetic, infra-red • Pressure measurement devices such as transmitters, switches, gauges • Temperature measurement devices such as transmitters, switches, RTD's, thermocouples, thermometers, temperature gauges

Specific Skills: Amplification and Guidance
Assessed in Practical Observation with Questions: **Instrumentation Control and Automation**
I11. Carry out **isolation procedures** to ensure process or system stability and personnel safety when carrying out operations
Isolation procedures • Safely isolate equipment from all sources of energy

Core Skills
Assessed in Interview
Knowledge K4. Principles and processes that underpin the location, diagnosis and rectification of faults. **Skills** S1. Apply technical knowledge to carry out inspections, condition monitoring and reporting. S3. Locate, diagnose and rectify faults on plant and equipment. S5. Use workshop machinery and equipment to create, repair and modify component and apparatus. S7ii. Communicate with and provide information and guidance to contractors, suppliers in line with personal role and responsibilities. S12. Drive vehicles equipped with tools and materials to job sites. S13ii. Install, replace and commission equipment and components as required. S14. As required, undertake standby duties to provide 24-hour cover to remedy fault situations requiring diagnostic testing procedures. **Behaviours** B3. Deliver a polite, courteous professional service to customers and members of the public. B4ii. Work effectively and safely when undertaking tasks to approved standards and safe working practices as part of a team or with appropriate supervision. B7ii. Be professional in work and in personal standards. B9. Accept, allocate and supervise technical and other tasks. B10. Be aware of the needs and concerns of others, especially where related to diversity and equality. B11. Carry out and record CPD necessary to maintain and enhance competence. B12. Exercise responsibilities in an ethical manner.

Specific Skills
Assessed in Interview
Electrical E1. Inspect and monitor electrical systems, and inspect, monitor, maintain and repair electrical equipment. E2. Test electrical equipment and systems and assist in installing electrical systems and equipment. E3. Access a range of sites to install, maintain, test, repair and dismantle electrical equipment. E5. Consult design specifications to analyse and calculate electrical system parameters and rectification procedures. E6. Interpret electrical drawings to install, position or re-locate electrical equipment and cabling. E7. Test, service and repair electrical equipment as part of planned preventative maintenance and/or reactive maintenance programmes. E8. Install and connect electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment. E10. Carry out basic fault diagnostics on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems.
Mechanical M1. Apply mechanical theories and principles in order to carry out diagnostic fault finding procedures. M2ii. Inspect and monitor mechanical systems, and inspect, monitor, dismantle and repair mechanical equipment and components. M3. Test mechanical equipment and systems and assist in installing mechanical systems and equipment. M4. Basic Fabrication and welding of structures and components. M5. Use mechanical knowledge and skills to install, maintain and dismantle a wide range of complex plant, machinery and components. M6. Consult design specifications to analyse and calculate mechanical system parameters and rectification procedures. M7. Interpret plans and drawings to install, position or re-locate mechanical equipment and components. M8ii. Repair mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes. M9. Install and maintain mechanical components including motors, pumps and gearboxes, maintaining and replacing lubricants. M10. Inspect and maintain condition monitoring equipment.

Specific Skills
Assessed in Interview
Instrumentation Control and Automation I1. Apply theories and principles of electronics to use equipment to carry out diagnostic fault finding procedures. I2ii. Repair and overhaul instrumentation and control equipment. I3. Test and Calibrate Instrumentation and control equipment and circuits and assist in installing instrumentation and control equipment. I4ii. Use instrumentation and Control Systems knowledge and skills to install, and dismantle instruments, controllers, probes, attachments, cabling, meters and display units. I5. Carry out telemetry outstation and internal system configuration. I6. Identify and resolve data quality and calibration issues. I8ii. Repair and configure field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems. I9. Use standards and specifications to improve the information gathered by telemetry data. I10. Inspect and maintain security equipment, telecommunication devices and alarm systems. I12. Provide support to day-to-day users of instrumentation and control systems. I13. Complete data cleansing to ensure consistent and valid data is available for business and regulation purposes.

Core Skills: Amplification and Guidance
Assessed in Interview: All pathways
K4. **Principles and processes** that underpin the location, diagnosis and rectification of faults S3. Locate, diagnose and rectify faults on plant and equipment
Principles and processes such as, but not limited to • Sensory perception: visual, smell, touch, sound • Six point technique • Half split method • Input to output technique • Functional testing • Unit substitution • Injection and sampling techniques • Equipment self-diagnostics
S1. Apply **technical knowledge** to carry out inspections, condition monitoring and reporting (see E1, E3, M2, M10, I2)
Technical knowledge • Maintenance and repairing of equipment • Defects and their causes

Core Skills: Amplification and Guidance
Assessed in Interview: All pathways
• Calibration of equipment • Company recording and reporting procedures
S5. Use **workshop machinery and equipment** to create, repair and modify **component and apparatus**
Workshop machinery and equipment including, but not limited to • Drills, grinders, bearing heaters and/or pullers, test bench • Safe operating of equipment **Component and apparatus** including but not limited to • Electrical equipment: switchgear, circuit breakers, motors, transformers, motor control centres, drive mechanisms, LV (low voltage) ELV (extra low voltage) circuits • ICA equipment: SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner • Mechanical equipment: Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening components, chemical dosing equipment

Core Skills: Amplification and Guidance
Assessed in Interview: All pathways
S7ii. **Communicate with and provide information and guidance** to contractors, suppliers in line with personal role and responsibilities
Communicate with and provide information and guidance • Provision of accurate verbal and written reports in line with company policy and procedures • A polite and courteous service to relevant people
S12. **Drive vehicles** equipped with tools and materials to job sites
Drive vehicles, if required • Full driving licence or demonstrate progress to working towards achieving a full driving licence • Complying with company driving procedures • Carry out vehicle checks • Safely load vehicles
S13ii. Install, replace and commission **equipment and components** as required

Core Skills: Amplification and Guidance

Assessed in Interview: All pathways

Equipment and components including

- Electrical equipment: switchgear, circuit breakers, motors, transformers, motor control centres, drive mechanisms, LV and ELV circuits
- ICA equipment: SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner
- Mechanical equipment: Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening components, chemical dosing equipment

S14. As required, undertake **standby duties** to provide 24-hour cover to remedy fault situations requiring diagnostic testing procedures

Standby duties if required

- A willingness to undertake priority out of hours work activities
- Provide an explanation of the hazards of working alone out of hours in line with the company procedures

Behaviours

B3. Deliver a polite, courteous professional service to customers and members of the public

B4ii. Work effectively and safely when undertaking tasks to approved standards and safe working practices as part of a team or with appropriate supervision

Core Skills: Amplification and Guidance
Assessed in Interview: All pathways
B7ii. Be professional in work and in personal standards B9. Accept, allocate and supervise technical and other tasks B10. Be aware of the needs and concerns of others, especially where related to diversity and equality B11. Carry out and record CPD necessary to maintain and enhance competence B12. Exercise responsibilities in an ethical manner

Specific Skills: Amplification and Guidance
Assessed in Interview: Electrical
E1. Inspect and monitor **electrical systems**, and inspect, monitor, maintain and repair **electrical equipment** E3. Access a range of sites to install, maintain, test, repair and dismantle **electrical equipment** E2. Test **electrical equipment and systems** and assist in installing **electrical systems and equipment** E7. Test, service and repair **electrical equipment** as part of planned preventative maintenance and/or reactive maintenance programmes E5. Consult design specifications to analyse and calculate **electrical system** parameters and rectification procedures
Electrical systems and equipment include • LV (low voltage) ELV (extra low voltage) systems • AC and DC power systems • Motors and starters • Switchgear and distribution panels • Control systems and components • Lighting systems • Switchgear, circuit breakers, motors, transformers, motor control centres, drive mechanisms
E6. Interpret electrical drawings to install, position or re-locate electrical equipment and cabling E8. Install and connect electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment
Electrical drawings • Refer to technical drawings to confirm specification

Specific Skills: Amplification and Guidance
Assessed in Interview: Electrical
E10. Carry out **basic fault diagnostics** on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems
Basic fault diagnostics • Using diagnostic equipment such as multimeter, multi-functional tester, network analysers, insulation resistance testers to identify faults such as o Input/output o Bad limit switch, bad motor o Power supply o Broken / damaged equipment o Equipment not earthed o Faulty sensors o Closed/open circuit devices

Specific Skills: Amplification and Guidance
Assessed in Interview: Mechanical
M1. Apply mechanical theories and principles in order to carry out diagnostic fault finding procedures
Mechanical theories and principles • Forces, motion, space, time, mass, work, energy • Newton's Laws • Torque **Fault finding procedures** • Sensory perception: visual, smell, touch, sound • Six point technique • Half split method • Input to output technique • Functional testing • Unit substitution • Injection and sampling techniques • Equipment self-diagnostics

Specific Skills: Amplification and Guidance

Assessed in Interview: Mechanical

M2ii. Inspect and monitor **mechanical systems**, and inspect, monitor, dismantle and repair **mechanical equipment and components**
M10. Inspect and maintain **condition monitoring equipment**
M3. Test **mechanical equipment and systems** and assist in installing mechanical systems and equipment
M7. Interpret plans and drawings to install, position or re-locate **mechanical equipment and components**
M8ii. Repair **mechanical equipment** as part of planned preventative maintenance and/or reactive maintenance programmes
M9. Install and maintain **mechanical components** including motors, pumps and gearboxes, maintaining and replacing lubricants

Mechanical systems / mechanical equipment and components

- Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening components, chemical dosing equipment

Condition monitoring equipment such as, but not limited to

- Vibration analysis, thermal imaging, ultrasonics, motor testing, laser alignment

M4. Basic **fabrication** and **welding** of structures and components

Fabrication including

- Sheet metal, plate

Specific Skills: Amplification and Guidance
Assessed in Interview: Mechanical
Welding techniques and positions such as, but not limited to • Lap, fillet, tee, butt, horizontal-vertical, vertical up, overhead, vertical down
M5. Use mechanical knowledge and skills to install, maintain and dismantle a wide range of complex **plant, machinery and components**
Plant, machinery and components • Bearing types, couplings type, belt/chains driven devices, gaskets, gearboxes, gland packing, impellors, mechanical seals, valves and penstocks, process equipment, position sensors, heat exchangers, proximity devices including sensors, solenoids, limit switches, pumping systems, aerators, filters and filter systems, scrapers and scraper systems, rotating biological contactors, digesters, actuators, blowers, compressors, air absorption vessels, air receivers, inlet and screening components, chemical dosing equipment
M6. Consult design specifications to analyse and calculate **mechanical system parameters** and rectification procedures
Mechanical system parameters including • Vibration • Pressure • Contamination • Purity

Specific Skills: Amplification and Guidance
Assessed in Interview: Mechanical
• Level • Flow • Trend analysis

Specific Skills: Amplification and Guidance
Assessed in Interview: Instrumentation Control and Automation
I1. Apply **theories and principles** of electronics to use equipment to carry out diagnostic fault finding procedures
Theories and principles • Voltage, current, power, sine waves • Single phase circuits, series and parallel circuits • Electronic amplifier circuits, AC and DC circuits • Design and test of digital electronic circuits used in electro-mechanical systems • Bernoullis Principle (circuit theory?) • Norton's Theorem **Fault finding procedures** • Sensory perception: visual, smell, touch, sound • Six point technique • Half split method • Input to output technique • Functional testing • Unit substitution • Injection and sampling techniques

Specific Skills: Amplification and Guidance
Assessed in Interview: Instrumentation Control and Automation
• Equipment self-diagnostics • Trend analysis
I2ii. Repair and overhaul **instrumentation and control equipment** I3. Test and calibrate **instrumentation and control equipment** and **circuits**, and assist in installing **instrumentation and control equipment**
Instrumentation and control equipment • SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner **Circuits** • Single phase circuits, series and parallel circuits • Electronic amplifier circuits, AC and DC circuits • Test of digital electronic circuits used in electro-mechanical systems
I5. Carry out **telemetry** outstation and internal system configuration I6. Identify and resolve data quality and calibration issues I9. Use standards and specifications to improve the information gathered by **telemetry** data
Telemetry • Sensors

Specific Skills: Amplification and Guidance
Assessed in Interview: Instrumentation Control and Automation
• Transmitters • Communications technologies • Software **Calibration issues** • Hysteresis • Repeatability • Linearity • Temperature • Gravity
I4ii. Use Instrumentation and Control Systems knowledge and skills to install, and dismantle **instruments**, controllers, probes, attachments, cabling, meters and display units I8ii. Repair and configure field instrumentation, communication devices and associated equipment used in system and process control, such as Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems I10. Inspect and maintain security equipment, telecommunication devices and alarm systems
Instruments • SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner
I12. Provide support to day-to-day users of **instrumentation and control systems**

Specific Skills: Amplification and Guidance
Assessed in Interview: Instrumentation Control and Automation
Instrumentation and control systems • SCADA units, sensors, analysers, pressure transmitter, level transmitter, flow transmitter, temperature transmitter, valve positioner
I13. Complete data cleansing to ensure consistent and valid data is available for business and regulation purposes
• Ensuring data is captured and presented in the relevant format • Ensuring data is relevant and of the quality required

EPA Specification Utilities Engineering Technician

EPA Specification Section 5 – Assessment

- Assessment summary
- Retake and resit information
- Overall grading
    - 5.1 Observation
    - 5.2 Interview
    - 5.3 Multiple-Choice Test

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for end-point assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

Assessment Summary

The end-point assessment for Utilities Engineering Technician (UET) consists of three components:

Observation

- This is an assessment which will take 4 hours. It involves an independent assessor observing and questioning an apprentice undertaking work as part of their normal duties in their workplace. Simulation is not permitted. The independent assessor will ask questions in relation to underpinning knowledge or where an opportunity to observe an activity has not naturally occurred.

Interview

- This is a face-to-face interview which lasts for 60 minutes. It consists of an Independent Assessor asking an apprentice a series of questions to assess their competence against the KSBs. The interview is underpinned by an evidence portfolio which is collated by the apprentice. The portfolio is not directly assessed, but is reviewed by the assessor and must be made available to EUIAS 2 weeks before the interview.

Multiple-Choice Test

- The test ensures that the apprentice has acquired the underpinning knowledge to enable them to perform their role. The test consists of 40 multiple choice questions to be answered in a 60-minute assessment under controlled conditions. Each question will present the apprentice with 4 response answers from which they must select the correct one.

Roles and responsibilities

EUIAS will provide assessors.

The employer/provider will provide the knowledge test invigilator in accordance with EUIAS Invigilation guidelines. This will be agreed at the Registration stage (see Section 3).

The employer and training provider will provide the venues for all assessments, including settings for the practical observation which must be suitably equipped to allow the apprentice to attempt all aspects of the practical. The employer or training provider will provide all necessary tools and equipment for the apprentice.

The employer or training provider will adequately prepare apprentices for the end-point assessments and will ensure the portfolio evidence, to support the apprentice's interview, is submitted to EUIAS prior to interview at an agreed date.

Retake and resit information

Apprentices who fail one or more assessment methods 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. 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 EUIAS.

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 has to 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.

The questions asked during a resit of observation with questions will be different from those asked during the first attempt.

The questions asked during a resit of the multiple-choice test will be different from those asked during the first attempt.

Weightings and Overall 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 will individually grade the observation with questions and interview, according to the requirements. A person appointed by the EUIAS will mark and grade the multiple-choice test.

The individual assessment method grades are combined 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 achieve an overall EPA distinction’, apprentices must achieve a distinction in the observation with questions, a distinction in the interview and a pass in the multiple-choice test.

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

Observation	Interview	Multiple-Choice Test	Overall Grading
Any Grade	Any Grade	Fail	Fail
Any Grade	Fail	Any Grade	Fail
Fail	Any Grade	Any Grade	Fail
Pass	Pass	Pass	Pass
Distinction	Pass	Pass	Pass
Pass	Distinction	Pass	Pass
Distinction	Distinction	Pass	Distinction

EPA Specification Utilities Engineering Technician

EPA Specification Section 5.1 – Observation with Questions

- Introduction
- Criteria
- Grading

Contacts

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Introduction

An observation with questions involves an Independent Assessor observing and questioning an apprentice undertaking work as part of their normal duties, in the workplace. It allows for a demonstration of the KSBs through naturally occurring evidence. The observation will be of an apprentice completing their usual work. Simulation is not permitted. The observation with questions will take place in the apprentice's workplace.

The Independent Assessor will ask questions in relation to underpinning knowledge or where an opportunity to observe an activity has not naturally occurred.

The observation with questions will take four hours. It cannot be split, other than to allow comfort breaks as necessary or to allow the apprentice to move from one location to another as required. Where breaks occur, they will not count towards the total assessment time.

The Independent Assessor has the discretion to increase the time of the observation with questions by up to 10% to allow the apprentice to complete a task or respond to a question. Each Independent Assessor will only observe one apprentice at any one time, to ensure quality and rigour.

The employer will need to inform EUIAS of the task that the apprentice will carry out under observation. This information will be submitted to EUIAS using the Observation task – Employer form. This form will be used by the Independent Assessor to inform the apprentice on the day of the Observation.

Before the start of the observation with questions, apprentices will be provided with information on the format, including the timescales they will be working to. The time taken to give this information is exclusive of the assessment time.

The following activities must be observed during the observation:

- plan and prepare for work activities
- complete risk assessment and identify control measures
- communicate with a stakeholder/colleague for example, to outline work required/completed
- complete task documentation
- conduct planned, preventative or reactive specialist maintenance clean water/wastewater equipment, covering
    - two-three different types of maintenance tasks
    - two different types of equipment; equipment must have multiple parts/elements
    - use of at least three different tools and equipment, including 'test equipment'
    - equipment isolation.

It is sufficient for the maintenance activity to be completed on clean water or wastewater equipment

The specialism is determined by the option taken by the apprentice: electrical, mechanical or instrumentation control & automation.

The Independent Assessor will ask a minimum of five questions, across the tasks. As only

naturally-occurring work is observed, those KSBs that the apprentice did not have the opportunity to demonstrate can be assessed via questioning. The time for questioning is included in the overall assessment time.

The following KSBs are assessed during the Observation with questions:

- Knowledge (K2, K5)
- Skills (S2, S4, S6, S7i, S8, S9ii, S10, S11, S13i)
- Behaviours (B1, B2, B4i, B5, B6, B7i, B8)

See Section 4 for the references to the standard.

The apprentices should be made aware and should confirm their understanding of the requirements of the grading criteria in order to achieve their full potential in achieving a pass or distinction. If the apprentice does not achieve a 'pass' the apprentice will need to retake this EPA element, further information can be found in Section 5 'Retake and Resit Information'.

The EUIAS Service Delivery team will work with the employer or training provider to schedule the Observation with questions.

Observation Grading

The Observation is graded by the Independent Assessor appointed by EUIAS. The following tables explain the criteria that are applied in order to achieve each grade for the Observation.

To achieve a **Pass** for the Observation, a Pass is required in **ALL** relevant criteria:

To achieve a **Distinction** for the Observation, the apprentice must achieve a Pass PLUS **ALL** the Distinction criteria for the specialism.

Fail – Apprentices will fail where they do not demonstrate all the Pass criteria.

Theme KSBs	Pass Criteria	Distinction Criteria
Core - Health, safety and environment S2 S10 B4i B5 B6 B8	Completes risk assessment to identify risks and hazards in the workplace and applies suitable control measures to minimise risks to life, property and the environment. Conducts work in line with health and safety and environment practices, procedures and regulations. Monitors and maintains safe working conditions and practices. Conducts work in a way that contributes to sustainable development for example, considers use of resources, recycles waste materials, disposes of waste material following safe practice	
Core - Communication	Communicates with colleagues as required by the task; communication style is appropriate to the	Takes responsibility to explain the added benefits of the task completion and checks understanding with

Theme KSBs	Pass Criteria	Distinction Criteria
S7i S8	audience Provides technically correct information and guidance Handovers and confirms completion of engineering activities to the appropriate person Uses industry terminology accurately and appropriately Completes task documentation in full, accurately and legibly	contractor, supplier or colleague answering any outstanding queries accurately.
Core - Maintenance task K2 K5 S4 S6 S9ii S11 S13i B1 B2 B4i B7i B8	Identifies and organises required resource from information provided, including tools, equipment, materials for tasks. Considers the implications of cost, quality and security when making their choices Conducts maintenance tasks to specification and in-line with company processes, practices and procedures. Carries out safe isolation of equipment using permit and lock-off systems as required Asks for specialist advice when required	Justifies choice and use of resources, based on balancing the impact of cost, quality, safety, security and environment impact Considers options and choses the most efficient and effective approach for example, plans tasks, multi-tasks, reducing the need for self-correction after the task has commenced. Analyses and explains the potential consequences of not undertaking the maintenance Identifies and explains the potential issues that could arise during the work and how they mitigate against them

Theme KSBs	Pass Criteria	Distinction Criteria
Electrical option – Maintenance E4 E9	Uses electrical theories, principles and procedures to use test equipment as part of a planned preventative and/or reactive maintenance programme Carries out electrical procedures on industrial low voltage systems (up to 1000V AC; operates switchgear, fuses, motor control centres, transformers, manual & automatically controlled drives and motors to ensure they are electrically safe.	
Mechanical option – Maintenance M8i M2i	Tests and services mechanical equipment as part of a planned preventative and/or reactive maintenance programme	
ICA option – Maintenance I2i I4i I7 I8i I11	Tests, maintains, calibrates and validates fixed and portable analogue and digital instrumentation as part of a planned preventative and/or reactive maintenance programme	

EPA Specification Utilities Engineering Technician

EPA Specification Section 5.2 – The Interview

- Introduction
- Portfolio of Evidence Requirements
- Preparing for the Interview
- Grading
- Criteria

Contacts

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Introduction

The interview consists of an Independent Assessor asking an apprentice a series of questions to assess their competence against the KSBs. It allows for assessment of KSBs that do not occur on predicable or regular basis. The Independent Assessor leads this process to obtain information from the apprentice to enable a structured assessment decision-making process.

The interview will last for 60 minutes. The independent assessor has the discretion to increase the time of the interview by up to 10% to allow the apprentice to complete their last answer. The interview will have a minimum of nine questions. The purpose of the questions will be to cover the following topics:

- make components (S5)
- work allocation/supervision (B9 B4ii)
- professionalism (B3 B7ii)
- diversity and equality (B10)
- continued professional development (B11)
- ethical manner (B12)
- specialist duties (S1 S12 S14 plus Electrical: E1 E3 E7; Mechanical: M2ii M5 M8ii M9 M10; ICA: I5 I6 I9 I10 I11 I12 I13)
- specialist installation and commission of clean/wastewater equipment; decommission (S13ii plus Electrical: E2 E6 E8; Mechanical: M3 M4 M7; ICA: I3 I4ii)
- specialist fault finding and repairs (K4 S3 plus Electrical: E5 E10; Mechanical: M1 M6; ICA: I1 I2ii I8ii)

The specialism is determined by the option taken by the apprentice: electrical, mechanical or instrumentation control & automation.

In advance of the interview the apprentice will be required to collate a portfolio of evidence. Details of the requirements for the portfolio are given below. The Independent Assessor should have a minimum of five working days to review the portfolio of evidence. Apprentices will have access to their portfolio of evidence during the interview. Apprentices can refer to and illustrate their answers with evidence from their portfolio, however the portfolio evidence is not directly assessed. Evidence from the interview underpinned by portfolio of evidence will be assessed holistically using the grading criteria (see below).

EUIAS will make arrangements for the interview with the apprentice's employer. Apprentices will be given at least two-weeks' notice of the date and time of the interview.

The Independent Assessors will conduct and assess the interview. The interview should take place in a quiet room, free from distractions and influence. Video conferencing can also be used to conduct the interview. The interview can take place in the employer's premises or a suitable venue selected by the EPAO, for example a training provider's premises.

Portfolio of Evidence Requirements

Apprentices must compile a portfolio of evidence during the on-programme period of the

apprenticeship. The portfolio must contain evidence related to the KSBs that will be assessed by the interview. It **will typically contain eighteen discrete pieces of evidence mapped against the KSBs**. The 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 (cumulative duration 60 minutes). The clip must be succinct to provide the evidence described. The apprentice must be in view and identifiable. The clip must be timestamped to pinpoint the exact evidence to be considered.

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

The portfolio 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 interview and will not be marked by the EUIAS. The Independent Assessor will review the portfolio in preparation for the interview but is not required to provide feedback after the review of the portfolio.

Interview Grading

The Interview is graded by the Independent Assessor appointed by EUIAS. The following tables explain the criteria that are applied in order to achieve each grade for the Interview.

To achieve a **Pass** for the Interview, a Pass is required in **ALL** relevant criteria:

To achieve a **Distinction** for the Interview, the apprentice must achieve a Pass PLUS **ALL** the Distinction criteria for the specialism.

Fail – Apprentices will fail where they do not demonstrate all the Pass criteria.

Theme KSBs	Pass Criteria	Distinction Criteria
Core – Health & safety B4ii	Describes how they have monitored and maintained safe working conditions and practices when working as part of a team or when supervised. Explains the implications of non-compliance with relevant health and safety standards, regulations and practice	
Core – Make components S5	Describes how they have used workshop machinery and equipment to create, repair and modify component and apparatus appropriately	
Core – Communicate S7ii	Describes how they communicate with contractors and suppliers and provide information and guidance in line with personal role and responsibilities	
Core - Work allocation/	Describes how they have managed tasks, including	

Theme KSBs	Pass Criteria	Distinction Criteria
supervision B4ii B9	delegation and supervision Describes how their contributions to a team project made a difference, whilst working to approved standards and safe working practices	
Core - Professionalism B3 B7ii	Describes how they have delivered a polite, courteous and professional service to customers and members of the public	
Core - Diversity and equality B10	Describes how they have taken account of the needs and concerns of others in relation to diversity and equality	
Core - Continued professional development B11	Describes the CPD activities they have completed and explains how it enhanced their competence	
Core –Ethical manner B12	Describes how they exercise responsibilities in an ethical manner	
Electrical option - Duties S1 S12 S14 E1 E3 E7	Describes how they have applied technical knowledge in their electrical duties: inspecting, condition monitoring and reporting; and testing servicing/maintaining and repairing electrical equipment	

Theme KSBs	Pass Criteria	Distinction Criteria
	Describes the different contexts/settings in which they have installed, maintained and tested electrical equipment If appropriate to the apprentice's workplace, describes their role in driving vehicles equipped with tools and materials to job sites If appropriate to the apprentice's workplace, describes how they provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures	
Electrical option - Electrical installation and commission of clean/wastewater equipment S13ii E2 E6 E8	Explains how they have installed or replaced and commissioned equipment and components (electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment), including interpretation of electrical drawings and testing	Identifies and explains the potential issues that could arise during the work and how they mitigate against them
Electrical option - Electrical fault finding and repair K4 S3 E5 E10	Describes how they have located, diagnosed and rectified faults on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems or similar Explains how they consulted design specifications to analyse and calculate electrical system parameters and rectification procedures	Describes different fault-finding methods they have used, justifying their choices

Theme KSBs	Pass Criteria	Distinction Criteria
Mechanical option –Duties S1 S12 S14 M2ii M5 M8ii M9 M10	Describes how they have applied technical knowledge in their mechanical duties: inspecting, condition monitoring and reporting, testing, installing, dismantling, repairing mechanical equipment and components Describes different types of complex plant, machinery and components they have worked on including motors, pumps and gear boxes If appropriate to the apprentice's workplace, describes their role in driving vehicles equipped with tools and materials to job sites If appropriate to the apprentice's workplace, describes how they provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures	
Mechanical option – Mechanical installation and commission of clean/ wastewater equipment S13ii M3 M4 M7	Explains how they have installed/repositioned, replaced, and commissioned equipment and components, including interpretation of plans and testing Describes use of fabrication and welding appropriate to the task	Identifies and explains the potential issues that could arise during the work and how they mitigate against them

EPA Specification Utilities Engineering Technician

EPA Specification Section 5.3 – The Multiple-Choice Test

- Introduction
- Preparing for the Multiple-Choice Test
- Criteria
- Grading

Contacts

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Introduction

The Multiple-Choice Test consists of 40 multiple choice questions sampling the knowledge and skills (listed below as K1, K3, and S9i) of the UET standard. Each multiple-choice question will have four options of which one will be correct. Apprentices must take the multiple-choice test in a suitably controlled environment in the presence of an invigilator

Multiple-choice tests are marked by markers employed by EUIAS. The practice test supplied as part of this document illustrates the formal and style of the assessment.

Preparing for the Multiple-Choice Test

- While on-programme, the employer or training provider should ensure the apprentice is familiar with all areas assessed by the Multiple-Choice Test
- The employer or training provider should support the apprentice to complete a practice test and provide them with formative feedback to enable them identify areas of further learning

Multiple-Choice Test Criteria

The criteria that are covered in the Multiple-Choice Test are listed below. In each assessment, questions will cover each of the areas; not every aspect of every area will be covered in every assessment. Refer to Section 4 for amplification and guidance.

KSB	Number of questions
K1 Relevant industry health and safety standards and regulations, and environmental; and regulatory requirements	19-21
K3 Relevant level of theory and principles that underpin the design and function of electromechanical and instrumentation systems and equipment	11-13
S9i Read, understand and interpret computer data and displays	7-9

Multiple-Choice Test Grading

The following grade boundaries apply to the multiple-choice test:

Grade	Mark
Fail	0 - 27 marks
Pass	28 - 40 marks

EPA Specification Utilities Engineering Technician

EPA Specification Section 6 – Practice Assessments and guidance

- Guidance for setting up a practical observation
- Preparing for the interview
- Preparing for the multiple-choice test
- Practice Test (in the Annex)

Contacts

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Observation with questions

Guidance for setting up a practical observation

The Observation focuses on an apprentice undertaking work as part of their normal duties. Simulation is not permitted. The expectation is that the observation with questions will take four hours. It will cover a number of activities. The activities are listed in Section 5.1.

While it is not permitted to brief the apprentice on the work they will be doing for the live Observation, it is permitted to set up tasks of similar complexity and duration and ask the apprentice to carry them out under live assessment conditions. To make the practice more realistic, a tutor or supervisor should adopt the role of assessor and use the appropriate grading criteria from Section 5 to 'assess' the apprentice.

The practice task brief should provide specification instructions for the apprentice to be able to:

- plan and prepare for the job
- complete risk assessment and identify control measures
- communicate with stakeholders/colleagues appropriately
- complete task documentation
- carry out preventative or reactive maintenance based on the apprentice's specialism.

The live observation also includes questioning from the Independent Assessor. The questioning is designed to demonstrate the apprentice's understanding of KSBs that are evidenced through the observation. We recommend developing some open-ended questions which focus on the eliciting each apprentice's understanding of the KSBs. The relevant questions can be used where competence is not confirmed through the observation of natural performance. Follow-up questions can also be asked where clarification is required.

The tutor or supervisor carrying out the practice observation should record their assessment of how the apprentice performed and provide feedback to the apprentice with guidance on what to do to improve their performance, taking note of the grading descriptors for pass and distinction in Section 5.

Interview

Preparing for the interview

The discussion will take place between the apprentice and the Independent Assessors. The Interview is an effective way of assessing KSBs that do not occur on a predictable or regular basis and will allow the apprentice to showcase the depth and breadth of their understanding. It is underpinned by a portfolio of evidence which is not marked. Details of the portfolio requirements are given in Section 5.2.

It is a good time to schedule a practice interview. It must be done with enough time to provide feedback for the apprentice to learn from, before the live end-point assessment. A period of two weeks or more is recommended, depending on the circumstances. The key is that the apprentice has time to act on the feedback they get at the end of the practice session.

A period of 60 minutes should be set aside for each practice interview, and a set of open-ended

questions prepared to cover each of the areas of the standard covered by the review.

A tutor or supervisor should play the part of the assessor carrying out the review, asking the questions in a 'live test environment'. They should record their assessment of the apprentice's performance, using the grading descriptions in Section 5 as a guide, and provide the apprentice with feedback, focussing on areas of improvement.

The questioning should synoptically examine the knowledge, skills and behaviours by the apprentice through their on-programme experience. The questioning should be contextualised to the apprentice's specific job role. The tutor or supervisor must:

- prepare some interview questions around the work that the apprentice has been doing. This should be based as much as possible on evidence that has been collated for the portfolio
- use various questioning techniques to confirm the depth of knowledge and or range of skills
- record the Interview or provide a clear narrative if the interview was not recorded. The narrative must describe the apprentices' responses to the questions. The narrative must capture the depth and breadth of the apprentice's response
- ensure the apprentice has provided evidence in their responses to cover all the relevant elements of the standard
- provide feedback to the apprentice focussing on any areas of the standard missed, or where appropriate, to give guidance on achieving the pass or distinction grades.

The apprentice should be prepared to:

- compile a portfolio and submit it to EUIAS at least 2 weeks days before the Interview
- discuss evidence of their work as recorded in the portfolio. The portfolio should have examples of job-related tasks so the panel can determine the role the apprentice had taken on to complete the work and understand if and how they overcame any challenges or barriers that were faced to complete the job.
- attend the Interview which will be expected to last 60 minutes.

The Multiple-Choice Test

Preparing for the multiple-choice test

While on-programme, the employer and or training provider should brief the apprentice on the areas to be assessed by the Multiple-Choice Test, as detailed in Section 5.3. These are the selected knowledge elements of the standard: K1, K3 and S9ii. It is good practice to identify the areas within the learning programme where the relevant knowledge is delivered and ensuring that apprentices are aware that elements from each of these criteria might come up in the test.

The Multiple-Choice Test is aligned to the standard rather than a specific job role that the apprentice may be doing. The questions have been written to reflect the Utilities Engineering Technician role as a whole and are not focussed on specific plant, machinery, or employer-specific processes.

In readiness for End-point Assessment, the apprentice should complete a sample test, which is included as an Annex to this specification. This should be undertaken in advance of the Multiple-Choice Test, with enough time to mark the assessment, and provide feedback to learners.

For maximum effect, ensure the test is taken in exam conditions similar to those that will be experienced in a live test.

EPA Specification Utilities Engineering Technician

EPA Specification Section 7 – Supporting Documents and Guidance

- Gateway Eligibility Report
- Practice Multiple-Choice Test (Electrical Pathway) with Answer Scheme
- Practice Multiple-Choice Test links for all pathways
- Observation Tasks – Employer Form

Contacts

This specification has been designed to provide all the advice and guidance you need to prepare yourself and your apprentices for end-point assessment. However, if you have any further questions please contact the EUIAS Help Desk using one of the following:

Help Desk email: enquiries@euias.co.uk

Help Desk telephone: 0121 713 8310

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Gateway Eligibility Report

(Standard Version: ST0159 version 1; Assessment Plan Version: ST0159/AP03)

Apprentice's name:	Apprentice's job title:
Name of Employer:	Name of Training provider:
Employer representatives present:	Training provider representatives present:
Apprenticeship start date:	Apprenticeship on-programme end date:
Gateway meeting date:	
Has the apprentice taken any part of the end-point assessment for this apprenticeship standard with any other End Point Assessment Organisation?	Y / N
If "Yes" please give details:	

Apprentice's details

Eligibility requirements:

The apprentice must confirm their achievement of the following:

Eligibility requirement	Achieved by the apprentice? Y/N	Evidence (scans of certificates MUST be included)
Achieved English level 2		
Achieved maths level 2		

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Gateway Eligibility Report

Gateway Eligibility Declaration

The apprentice, the employer and the training provider must sign this form to confirm that they understand and agree to the following:

1. The apprentice has completed the required on-programme elements of the apprenticeship and is ready for end-point assessment with EUIAS
2. The apprentice will only submit their own work as part of end-point assessment
3. All parties agree that end-point assessment evidence may be recorded and stored by EUIAS for quality assurance purposes
4. The apprentice has been on-programme for a minimum duration of 365 days
5. The apprentice has achieved the mathematics and English requirements as detailed in this document
6. The apprentice, if successful, gives permission for EUIAS to request the apprenticeship certificate from the ESFA who issue the certificate on behalf of the Secretary of State
7. The apprentice has been directed to the EUIAS Appeals Policy and Complaints Policy
8. The employer/training provider has given the EUIAS at least three months' notice of requesting this EPA for this apprentice
9. If the Gateway Eligibility Report is not completed in full, meeting all requirements, and submitted to EUIAS, the end-point assessment cannot take place

Signed on behalf of the employer (print name):	Signature:	Date:
Signed on behalf of the training provider (print name):	Signature:	Date:
Apprentice's name (print):	Signature:	Date:

EUIAS use only:	
EUIAS Sign off:	
Comments/actions:	

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Practice Multiple-Choice Test

(full version to follow)

Utilities Engineering Technician

Please write clearly in block capitals below	
Company name	
Forename (s)	
Last name (s)	
Date of birth	
Apprentice number	
Apprentice signature	
Date of knowledge test	

Level: 3

Standard: Utilities Engineering Technician

Pathway: Electrical

Duration: 1 hour

Materials

For this paper you must have:

- Pens
- Scientific calculator (non-programmable)

Instructions

- Use black ink or black ball-point pen
- Fill in the boxes at the top of this page
- Answer **all** questions
- There are questions, possible answers as well as a column for you to mark your answer
- Mark your answer with an ☒ against the possible answer you think is correct- if you wish to change your answer please put a line through ~~☒~~ and re-select with another ☒
- Only one answer per question allowed. Answers which do not follow the rules of selection will be disallowed. This may impact on the grade awarded

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Practice Multiple-Choice Test

- Do all rough work in this answer book

Below is a Sample:

London is the capital of….

-

Example Question		
London is the capital of…		
Possible answers		**Answer**
a)	Wales	~~X~~
b)	Scotland	
c)	Northern Ireland	
d)	England	**X**

Information

- There are 40 questions
- All questions should be attempted

Advice

- Do not spend too long on one question
- Read all questions thoroughly before starting your examination
- Mobile phones and watches must not be taken into the examination room. The examination must be conducted under examination conditions
- Cheating: you will be asked to leave the examination room and will be classified an automatic failure and referred to your employer

Do not turn over the page or commence the knowledge test until the invigilator instructs you to

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Practice Multiple-Choice Test

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Practice Multiple-Choice Test

Question 1		
How regularly should electrical safety equipment be inspected?		
Possible answers		**Answer**
a)	Daily	
b)	Weekly	
c)	Monthly	
d)	Prior to use	

Question 2		
State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.		
Possible answers		**Answer**
a)	To decide how heavy chemical containers are	
b)	To collect information about employees' health	
c)	To decide how often to check chemical stock levels for re-ordering	
d)	To identify the potential for exposure to harmful substances	

Question 3			
In the image below, what does the red sign mean?			
Possible answers		**Answer**	
a)	Mandatory behaviour		
b)	Prohibited behaviour		
c)	Information		
d)	Warning		

EUIAS Level 3 End-point Assessment for Utilities Engineering Technician

Practice Multiple-Choice Test

Question 4		
When working in these locations which one does NOT require a Confined Space Entry Permit?		
Possible answers		**Answer**
a)	Refrigeration Unit	
b)	Trench	
c)	Vessel	
d)	Ceiling Void	

LINKS to all practice papers

EPA Resources - End Point Assessment (euias.co.uk)

Employer Form for Observation with Questions

UET: Observation with Questions

Employer's name	

Observation Location Address	

Apprentice's name	

Pathway	

For Office Use Only:

Assessor's name	

Observation date	

Instructions

- The observation with questions must take four hours
- The observation with questions may not be split, other than to allow comfort breaks as necessary or to allow the apprentice to move from one location to another as required
- An Independent Assessor will
    - observe and question the apprentice undertaking work as part of their normal duties, in the apprentice's workplace
    - remain in visual contact with the apprentice throughout
    - ask a minimum of five questions, across the tasks, where competence is not confirmed through observation of natural performance
    - record the answers given with a preference towards audio recording
- Simulation is not permitted.

Employer Form for Observation with Questions

The following activities must be covered by the apprentice's work being observed	Description of task for apprentice [1]
• Planning and preparation for work activities • Completing risk assessment and identifying control measures • Communicating with a stakeholder or colleague for example, to outline work required or completed • Completing task documentation • Conducting planned, preventative or reactive specialist maintenance on clean water or wastewater equipment, covering ▪ Two-three different types of maintenance tasks ▪ Two different types of equipment. The equipment must have multiple parts/elements ▪ Use of at least three different tools and equipment, including 'test equipment' ▪ Equipment isolation. It is sufficient for the maintenance activity to be completed on either clean water or wastewater equipment.	

[1] This form can be optionally completed by employer and submitted to the EUIAS Service Delivery Team 10 working days before the day of the assessment.

Practice Assessment
Utilities Engineering Technician

Please write clearly in block capitals below	
Company name	
First name (s)	
Last name (s)	
Date of birth	
Apprentice signature	
Date of knowledge test	

Level: 3
Standard: Utilities Engineering Technician
Pathway: Electrical

Duration: 1 hour

Materials

For this paper you must have:

- Pens
- Scientific calculator (non-programmable)

Instructions

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- Only one answer per question allowed. Answers which do not follow the rules of selection will be disallowed. This may impact on the grade awarded
- Do all rough work in this answer book

Below is a Sample:

London is the capital of….

Example Question		
London is the capital of…		
Possible answers		**Answer**
a)	Wales	~~X~~
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c)	Northern Ireland	
d)	England	**X**

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- There are 40 questions
- The pass mark is 28
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In the image below, what does the red sign mean?			
Possible answers		**Answer**	
a)	Mandatory behaviour		
b)	Prohibited behaviour		
c)	Information		
d)	Warning		

Question 4		
Which ONE of the following locations does **NOT** require a Confined Space Entry Permit?		
Possible answers		**Answer**
a)	Refrigeration Unit	
b)	Trench	
c)	Vessel	
d)	Ceiling Void	

Question 5		
What is the correct order of working at height control measures?		
Possible answers		**Answer**
a)	1. Fall prevention 2. personal fall protection 3. avoid work at height 4. collective fall protection	
b)	1. Avoid work at height 2. fall prevention 3. collective fall protection 4. personal fall protection	
c)	1. Avoid work at height 2. collective fall protection 3. fall prevention 4. personal fall protection	
d)	1. Personal fall protection 2. collective fall protection 3. fall prevention 4. avoid work at height	

Question 6		
Which ONE of the following manual handling statements is true?		
Possible answers		**Answer**
a)	Correct manual handling prevents all accidents	
b)	Correct manual handling prevents damage to equipment	
c)	Correct manual handling should only be applied in the workplace	
d)	Correct manual handling reduces the risk of human injury	

Question 7		
Which ONE of the following regulations provide guidance on the use of handheld tools?		
Possible answers		**Answer**
a)	Control of Substances Hazardous to Health (COSHH)	
b)	Provision and Use of Work Equipment Regulations 1998 (PUWER)	
c)	Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)	
d)	Control of Major Accident Hazards Regulations 2015 (COMAH)	

Question 8		
Which ONE of the following activities must be completed before working in a confined space?		
Possible answers		**Answer**
a)	Modify the area so entry is not necessary	
b)	Check the worker has the right qualification	
c)	Ensure there is a safe system for working inside the space	
d)	Provide access and egress routes	

Question 9		
Which ONE of the following is commonly classed as safety-critical?		
Possible answers		**Answer**
a)	Fuse	
b)	Control valve	
c)	Steam trap	
d)	Drain valve	

Question 10		
In accordance with Health and Safety Executive (HSE) guidelines, which ONE of the following can apply isolations?		
Possible answers		**Answer**
a)	Experienced people	
b)	Skilled people	
c)	Lead technicians	
d)	Authorised people	

Question 11		
In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?		
Possible answers		**Answer**
a)	The substance will give off a strong odour	
b)	The substance will have a label identifying the hazard	
c)	The substance will be contained in a glass receptacle	
d)	The substance will be in a red container	

Question 12		
What type of information is provided on the coloured tag on a piece of rigging equipment?		
Possible answers		**Answer**
a)	Certification period	
b)	Safe working load	
c)	Maximum working load	
d)	Safe to use	

Question 13		
What type of document should be fixed to a scaffold before use?		
Possible answers		**Answer**
a)	Risk assessment	
b)	Safety certificate	
c)	Permit to work	
d)	Approved Scafftag	

Question 14		
Assuming an emergency shower is close by, what should a technician do if they come into contact with hazardous substances whilst wearing a protective suit?		
Possible answers		**Answer**
a)	Remove all clothing and douse down under the shower	
b)	Stand under the shower immediately and douse down under the shower	
c)	Complete the task and then douse down under the shower	
d)	Stop work and immediately report to the first aid room	

Question 15		
A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?		
Possible answers		**Answer**
a)	19.5% - 23.5%	
b)	14% - 19%	
c)	6% - 14%	
d)	< 6%	

Question 16		
What procedure is used to inform employees about health and safety?		
Possible answers		**Answer**
a)	Isolation	
b)	Risk assessment	
c)	Site audit	
d)	Toolbox talk	

Question 17		
Which ONE of the following must be tested before entering a confined space?		
Possible answers		
a)	Number of people wanting access	
b)	Oxygen content	
c)	Size of area	
d)	Noise levels	

Question 18		
What is the first action that should be taken when assessing a potentially hazardous substance?		
Possible answers		**Answer**
a)	Provide appropriate PPE (Personal and Protective Equipment)	
b)	Check the MSDS (Material Safety Data Sheet)	
c)	Check that there is space to store it safely	
d)	Conduct a risk assessment	

Question 19		
According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?		
Possible answers		**Answer**
a)	Elimination	
b)	Engineering	
c)	PPE	
d)	Substitution	

Question 20		
Two technicians are working on the same piece of equipment which is isolated using a padlock. What safe isolation practice should be used?		
Possible answers		**Answer**
a)	Give each technician a key to the padlock	
b)	Use a multi padlock isolation tool	
c)	Leave the key tied to the padlock	
d)	Apply a long-term isolation	

Question 21		
When two waves of the same frequency have the opposite phase, what is the phase angle between them?		
Possible answers		**Answer**
a)	0°	
b)	90°	
c)	180°	
d)	360°	

Question 22		
What is the total resistance in this circuit?		
		
Possible answers		**Answer**
a)	1500 Ω	
b)	500 Ω	
c)	100 Ω	
d)	50 Ω	

Question 23		
In a control system, what does the transducer do?		
Possible answers		**Answer**
a)	Changes a digital signal to a data packet	
b)	Converts a physical measurement into an electrical signal	
c)	Stores information and sends it to the site Supervisory Control and Data Acquisition (SCADA) system	
d)	Enables the equipment to work on 110V or 230V input voltages	

Question 24		
What is the formula for working out wattage?		
Possible answers		**Answer**
a)	Watts = Amps / Volts	
b)	Watts = Volts x Resistance	
c)	Watts = Amps x Volts	
d)	Watts = Resistance / Volts	

Question 25		
Using Ohms law, when the current is 12A and the resistance is 6 Ω, what is the volts value?		
Possible answers		**Answer**
a)	0.5 volts	
b)	2 volts	
c)	18 volts	
d)	72 volts	

Question 26		
What device is created when an insulated wire in an electrical circuit is wrapped around an iron core?		
Possible answers		**Answer**
a)	Electromagnet	
b)	Motor	
c)	Generator	
d)	Magnet	

Question 27		
On an electrical equipment label, what does the term ‘d’ refer to?		
		
Possible answers		**Answer**
a)	Type of protection	
b)	Temperature group	
c)	Gas group	
d)	Explosion protection	

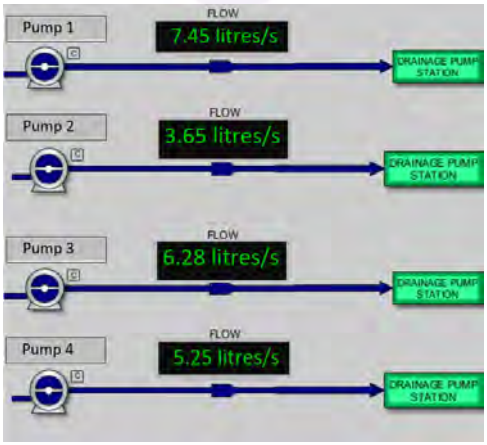
Question 28		
Which ONE of the following definitions best fits the terminology 'specification'?		
Possible answers		**Answer**
a)	The capacity to withstand continuous force	
b)	The standard when measured against another object of similar design	
c)	A detailed description of the design and materials of an object	
d)	The specified point beyond which certification is invalid	

Question 29		
Which device measures a change in process conditions?		
Possible answers		**Answer**
a)	Convertor	
b)	Microprocessor	
c)	PLC (programmable logic controller)	
d)	Sensor	

Question 30		
What is the metric SI (International System of Units) unit for torque?		
Possible answers		**Answer**
a)	Mn	
b)	Nm	
c)	Tq	
d)	N	

Question 31		
What type of maintenance is root cause analysis?		
Possible answers		**Answer**
a)	Preventative	
b)	Reflective	
c)	Planned	
d)	Reactive	

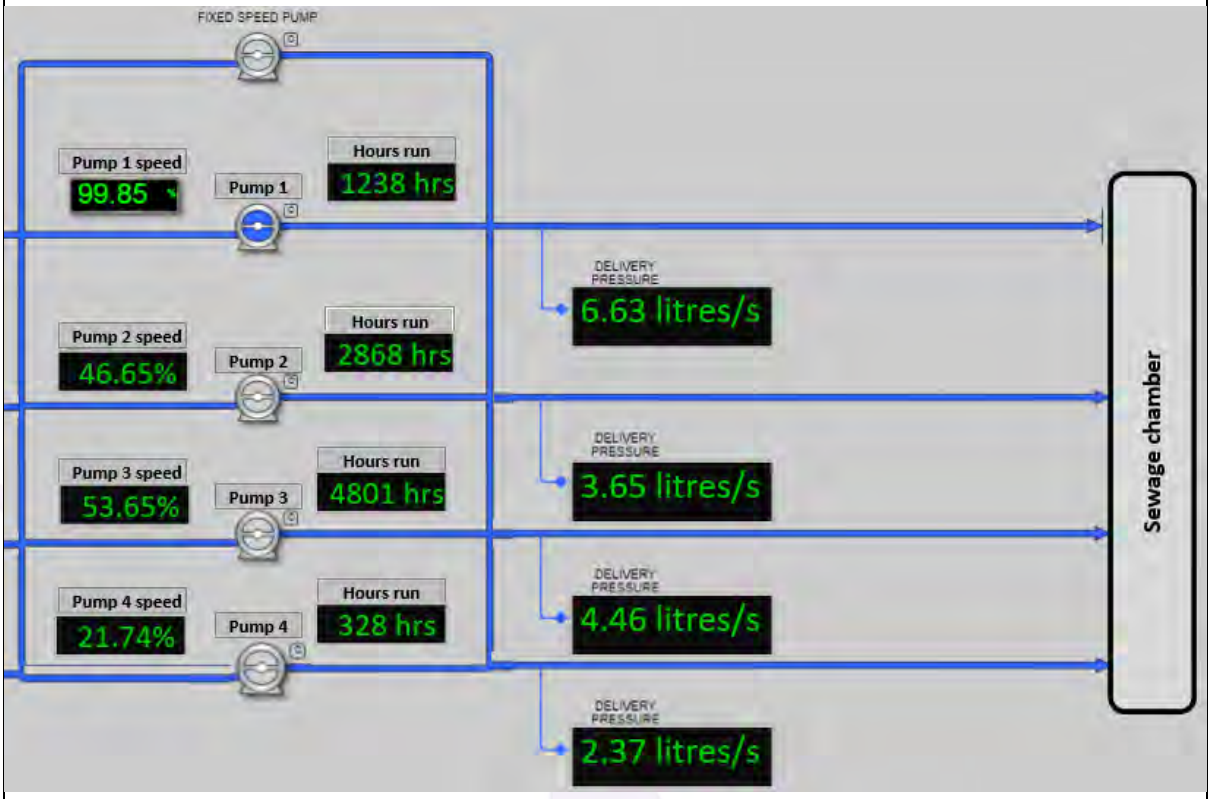
Question 32		
What does the symbol below represent when seen on a British Standard convention drawing? 		
Possible answers		**Answer**
a)	Electrical signal	
b)	Instrument signal	
c)	Hydraulic line	
d)	Pneumatic line	

Question 33		
Refer to the diagram below. Calculate the difference between the flow rates of pump 1 and pump 4. 		
Possible answers		**Answer**
a)	3.25 litres per second	
b)	2.25 litres per second	
c)	2.20 litres per second	
d)	2.05 litres per second	

Question 34

Refer to the display below.

Identify the average hours run time on the pump sets.



Possible answers		Answer
a)	3196.00 hours	
b)	2308.80 hours	
c)	55.47 hours	
d)	4.27 hours	

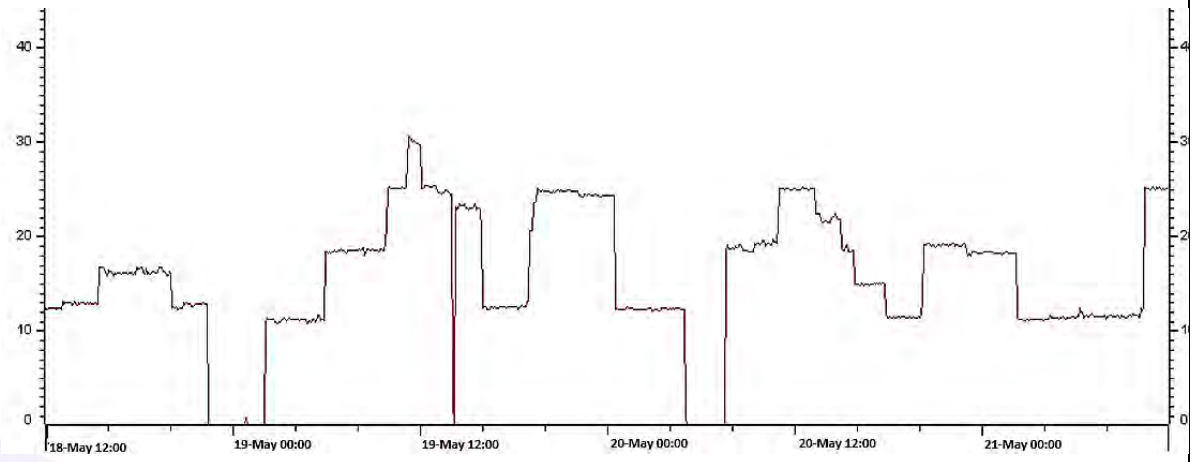
Question 35			
Refer to the image below. Which ONE of the following instruments would display this information?			
Possible answers		**Answer**	
a)	Dissolved oxygen analyser		
b)	Temperature transmitter		
c)	Human Machine Interface		
d)	pH probe		

Question 36			
Refer to the image below. What measurement is the reading displaying?			
Possible answers		**Answer**	
a)	Signal velocity		
b)	Viscosity of a liquid		
c)	Capacitance Probe (RF)		
d)	Turbidity		

Question 37

Refer to the trend analysis snapshot below of a pumping station.

On what day did the maximum flow rate occur?

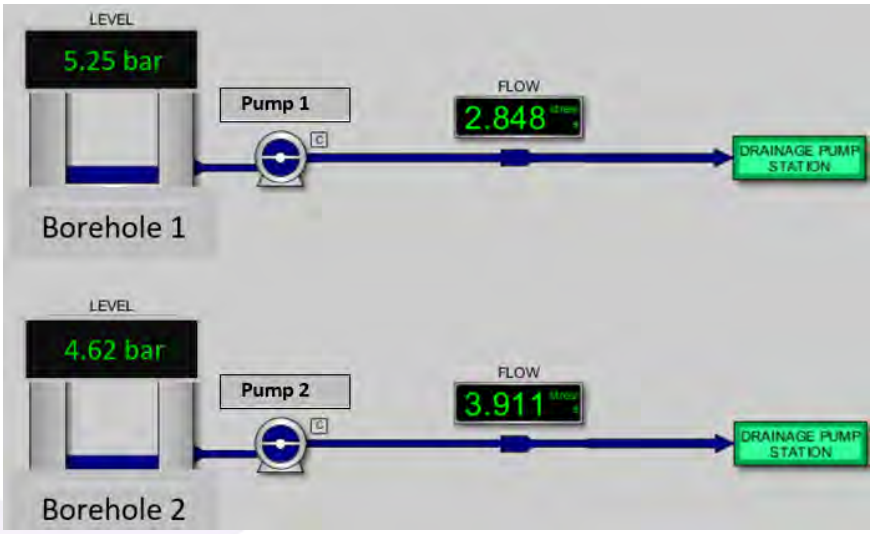


Possible answers		Answer
a)	18 May	
b)	19 May	
c)	20 May	
d)	21 May	

Question 38

Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH_2O, what is the current level in mH_2O of bore hole 1

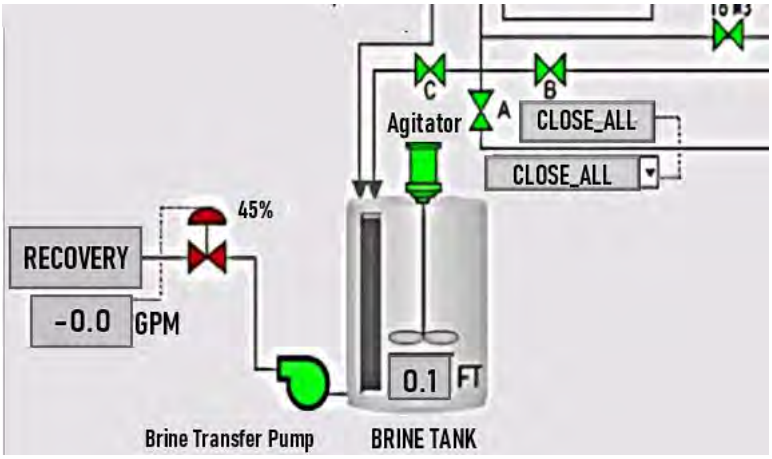


Possible answers		Answer
a)	29.04 mH_2O	
b)	39.9 mH_2O	
c)	47.1 mH_2O	
d)	53.5 mH_2O	

Question 39

Refer to the extract from a SCADA display.

Which ONE of the following figures is the flowrate from the brine tank to the Recovery?

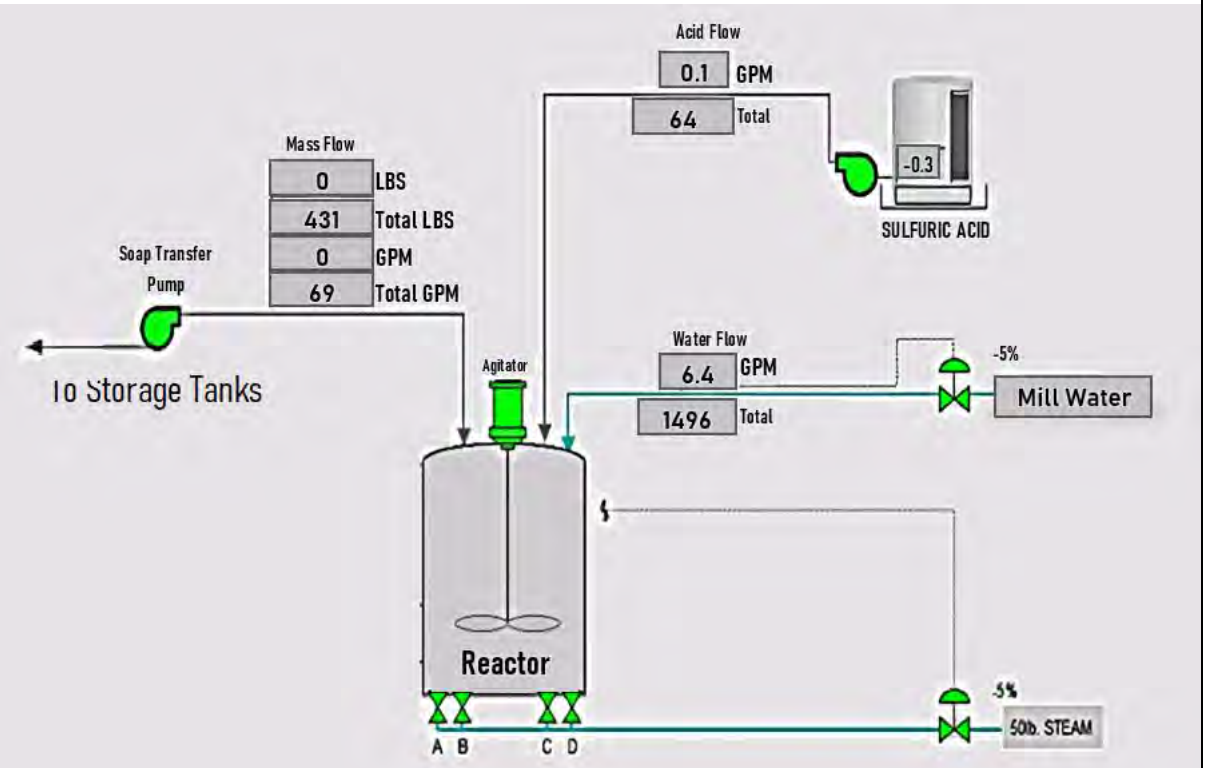


Possible answers		Answer
a)	-0.0 Gallons Per Minute	
b)	The information is not in the display	
c)	0.1 FT	
d)	45%	

Question 40

Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor.

What could prevent the water flow reaching the reactor?



Possible answers		Answer
a)	High levels in the storage tank	
b)	Open pneumatic valve	
c)	Blockage from the West Storage	
d)	Closed pneumatic valve	

End of Practice Knowledge Assessment

ENERGY & UTILITIES INDEPENDENT ASSESSMENT SERVICE

Practice Knowledge Assessment

Answer scheme

Question	Answer	Question	Answer	Question	Answer
1	D	**15**	A	**29**	D
2	D	**16**	D	**30**	B
3	B	**17**	B	**31**	D
4	D	**18**	B	**32**	D
5	B	**19**	C	**33**	C
6	D	**20**	B	**34**	B
7	B	**21**	A	**35**	A
8	C	**22**	B	**36**	D
9	A	**23**	B	**37**	B
10	D	**24**	C	**38**	D
11	B	**25**	D	**39**	A
12	A	**26**	A	**40**	D
13	D	**27**	A		
14	B	**28**	C		

Practice Assessment
Utilities Engineering Technician

Please write clearly in block capitals below	
Company name	
First name (s)	
Last name (s)	
Date of birth	
Apprentice signature	
Date of knowledge test	

Level: 3
Standard: Utilities Engineering Technician
Pathway: Instrumentation Control and Automation
Duration: 1 hour

Materials

For this paper you must have:

- Pens
- Scientific calculator (non-programmable)

Instructions

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London is the capital of…		
Possible answers		**Answer**
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How regularly should electrical safety equipment be inspected?		
Possible answers		**Answer**
a)	Daily	
b)	Weekly	
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d)	Prior to use	

Question 2		
What procedure is used to inform employees about health and safety?		
Possible answers		**Answer**
a)	Risk assessment	
b)	Isolation	
c)	Toolbox talk	
d)	Site audit	

Question 3			
What type of safety sign is shown below?			
Possible answers		**Answer**	
a)	Mandatory		
b)	Warning		
c)	Prohibition		
d)	Emergency		

Question 4		
According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?		
Possible answers		**Answer**
a)	Elimination	
b)	Engineering	
c)	PPE	
d)	Substitution	

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What is the first action that should be taken when assessing a potentially hazardous substance?		
Possible answers		**Answer**
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d)	Conduct a risk assessment	

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Question 7		
A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?		
Possible answers		
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b)	14% - 19%	
c)	6% - 14%	
d)	< 6%	

Question 8			
What does this green sign mean?			
Possible answers		**Answer**	
a)	Prohibited behaviour		
b)	Warning		
c)	Mandatory behaviour		
d)	Information		

Question 9		
Which ONE of the following regulations provide guidance on the use of handheld tools?		
Possible answers		**Answer**
a)	Control of Substances Hazardous to Health (COSHH)	
b)	Provision and Use of Work Equipment Regulations 1998 (PUWER)	
c)	Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)	
d)	Control of Major Accident Hazards Regulations 2015 (COMAH)	

Question 10		
Which ONE of the following is commonly classed as safety-critical?		
Possible answers		**Answer**
a)	Fuse	
b)	Control valve	
c)	Steam trap	
d)	Drain valve	

Question 11		
In accordance with Health and Safety Executive (HSE) guidelines, which ONE of the following apply isolations?		
Possible answers		**Answer**
a)	Experienced people	
b)	Skilled people	
c)	Lead technicians	
d)	Authorised people	

Question 12		
In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?		
Possible answers		**Answer**
a)	The substance will give off a strong odour	
b)	The substance will have a label identifying the hazard	
c)	The substance will be contained in a glass receptacle	
d)	The substance will be in a red container	

Question 13		
What type of information is provided on the coloured tag on a piece of rigging equipment?		
Possible answers		**Answer**
a)	Certification period	
b)	Safe working load	
c)	Maximum working load	
d)	Safe to use	

Question 14		
What type of document should be fixed to a scaffold before use?		
Possible answers		**Answer**
a)	Risk assessment	
b)	Safety certificate	
c)	Permit to work	
d)	Approved Scafftag	

Question 15		
Which ONE of the following must be tested before entering a confined space?		
Possible answers		
a)	Number of people wanting access	
b)	Oxygen content	
c)	Size of area	
d)	Noise levels	

Question 16		
When working in these locations which one does NOT require a Confined Space Entry Permit?		
Possible answers		**Answer**
a)	Refrigeration Unit	
b)	Trench	
c)	Vessel	
d)	Ceiling Void	

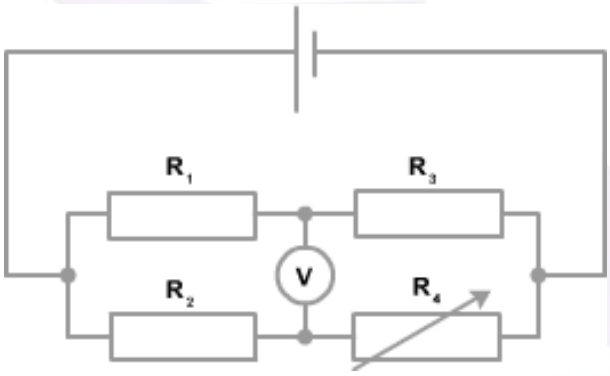
Question 17		
An operative is asked to carry out a task that will create dust. What will they need to do?		
Possible answers		**Answer**
a)	Dust is not a hazardous substance, so no safety measures are required	
b)	Wait until the wind is strong so it will blow the dust away	
c)	Wear the PPE identified on the permit or risk assessment	
d)	Only work for short periods and take regular breaks	

Question 18		
Which ONE of the following manual handling statements is true?		
Possible answers		**Answer**
a)	Correct manual handling prevents all accidents	
b)	Correct manual handling prevents damage to equipment	
c)	Correct manual handling should only be applied in the workplace	
d)	Correct manual handling reduces the risk of human injury	

Question 19		
What is the correct order of working at height control measures?		
Possible answers		**Answer**
a)	1. Fall prevention 2. personal fall protection 3. avoid work at height 4. collective fall protection	
b)	1. Avoid work at height 2. fall prevention 3. collective fall protection 4. personal fall protection	
c)	1. Avoid work at height 2. collective fall protection 3. fall prevention 4. personal fall protection	
d)	1. Personal fall protection 2. collective fall protection 3. fall prevention 4. avoid work at height	

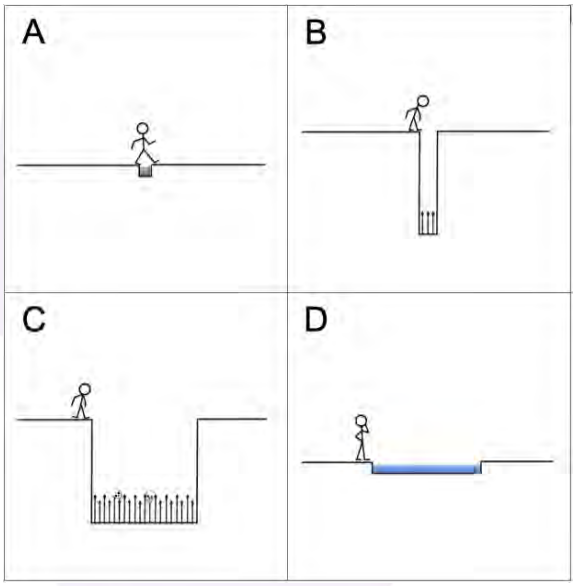
Question 20		
Assuming an emergency shower is close by, what should a technician do if they come into contact with hazardous substances whilst wearing a protective suit?		
Possible answers		**Answer**
a)	Remove all clothing and douse down under the shower	
b)	Stand under the shower immediately and douse down under the shower	
c)	Complete the task and then douse down under the shower	
d)	Stop work and immediately report to the first aid room	

Question 21		
Which ONE of the following definitions best fits the terminology 'specification'?		
Possible answers		**Answer**
a)	The capacity to withstand continuous force	
b)	The standard when measured against another object of similar design	
c)	A detailed description of the design and materials of an object	
d)	The specified point beyond which certification is invalid	

Question 22		
In the image below the bridge circuit is balanced. **If R1 = 200 Ω, R2 = 550 Ω and R4 = 100 Ω, what is the value of R3?**		
		
Possible answers		**Answer**
a)	2000 Ω	
b)	500 Ω	
c)	450 Ω	
d)	250 Ω	

Question 23		
What is the formula for Ohms law?		
Possible answers		**Answer**
a)	I = R × V	
b)	I = R ÷ V	
c)	I = V ÷ R	
d)	I = V × R	

Question 24			
Looking at the image provided and taking into consideration risk, which task is low probability and low in impact?			
Possible answers		**Answer**	
a)	A		
b)	B		
c)	C		
d)	D		



Question 25		
A technician is working on a flow transmitter with a linear feedback signal of 4-20 mA. The transmitter has a range of 0-1600 L/per min. The measured feedback signal is 14 mA. What is the flow rate?		
Possible answers		**Answer**
a)	1400 L/per min	
b)	1200 L/per min	
c)	1000 L/per min	
d)	800 L/per min	

Question 26		
An operative is working on a 4-20 mA pressure transmitter with a working range of 0-160 mbar. The pressure is set at 100 mbar. What would the expected feedback signal be?		
Possible answers		**Answer**
a)	14 mA	
b)	12 mA	
c)	10 mA	
d)	8 mA	

Question 27		
Which device measures a change in process conditions?		
Possible answers		**Answer**
a)	Sensor	
b)	Microprocessor	
c)	PLC (programmable logic controller)	
d)	Convertor	

Question 28		
What is the most common output range of a pneumatic transmitter?		
Possible answers		**Answer**
a)	0 to 1.9 bar	
b)	0 to 15 bar	
c)	0.2 to 1.0 bar	
d)	2 to 20 bar	

Question 29		
In a control system, what does the transducer do?		
Possible answers		**Answer**
a)	Changes a digital signal to a data packet	
b)	Converts a physical measurement into an electrical signal	
c)	Stores information and sends it to the site Supervisory Control and Data Acquisition (SCADA) system	
d)	Enables the equipment to work on 110V or 230V input voltages	

Question 30		
What is the metric SI (International System of Units) unit for torque?		
Possible answers		**Answer**
a)	Mn	
b)	Nm	
c)	Tq	
d)	N	

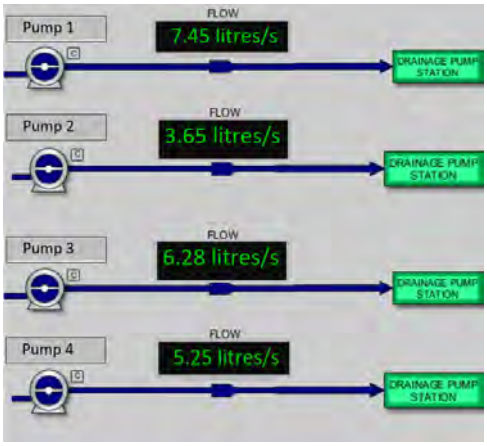
Question 31		
What type of maintenance is root cause analysis?		
Possible answers		**Answer**
a)	Preventative	
b)	Reflective	
c)	Planned	
d)	Reactive	

Question 32		
What does the symbol below represent when seen on a British Standard convention drawing? 		
Possible answers		**Answer**
a)	Electrical signal	
b)	Instrument signal	
c)	Hydraulic line	
d)	Pneumatic line	

Question 33

Refer to the diagram below.

Calculate the difference between the flow rates of pump 1 and pump 4.

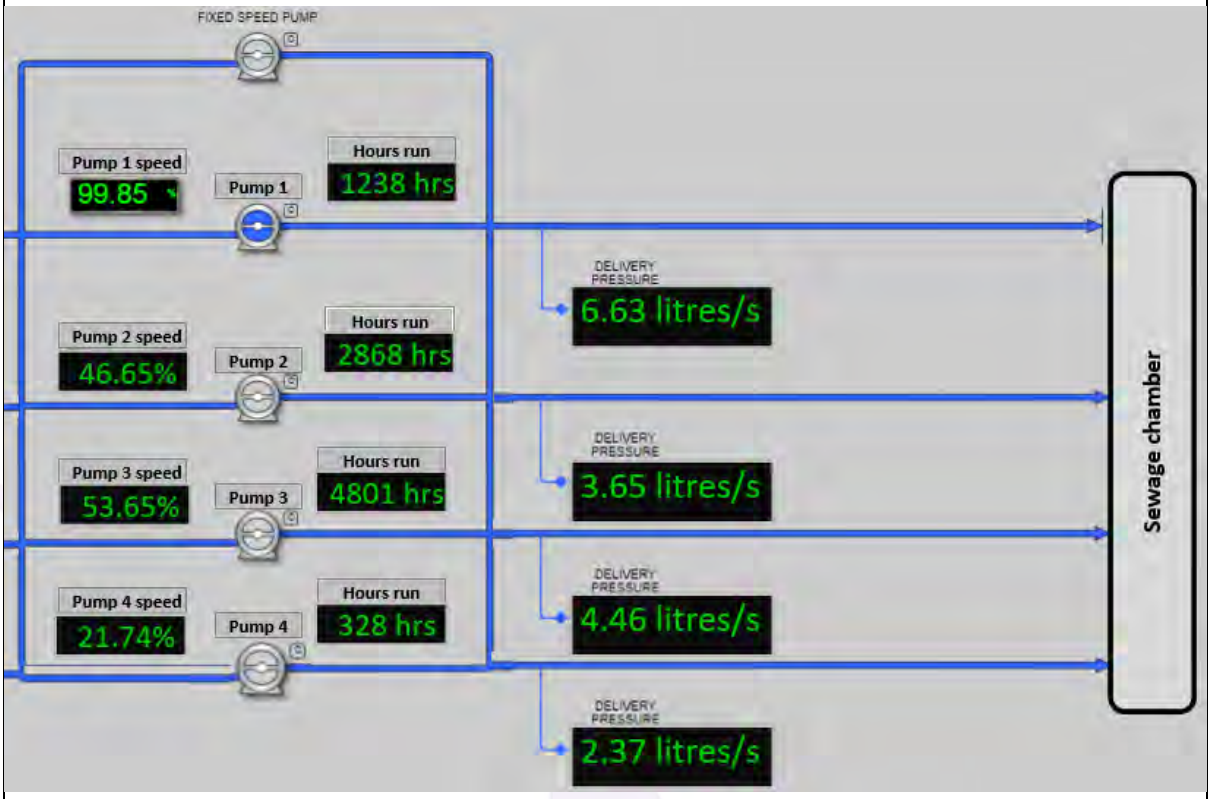


Possible answers		Answer
a)	2.05 litres per second	
b)	2.20 litres per second	
c)	2.25 litres per second	
d)	3.25 litres per second	

Question 34

Refer to the display below.

Identify the average hours run time on the pump sets.



Possible answers		Answer
a)	3196.00 hours	
b)	2308.80 hours	
c)	55.47 hours	
d)	4.27 hours	

Question 35

Refer to the image below.

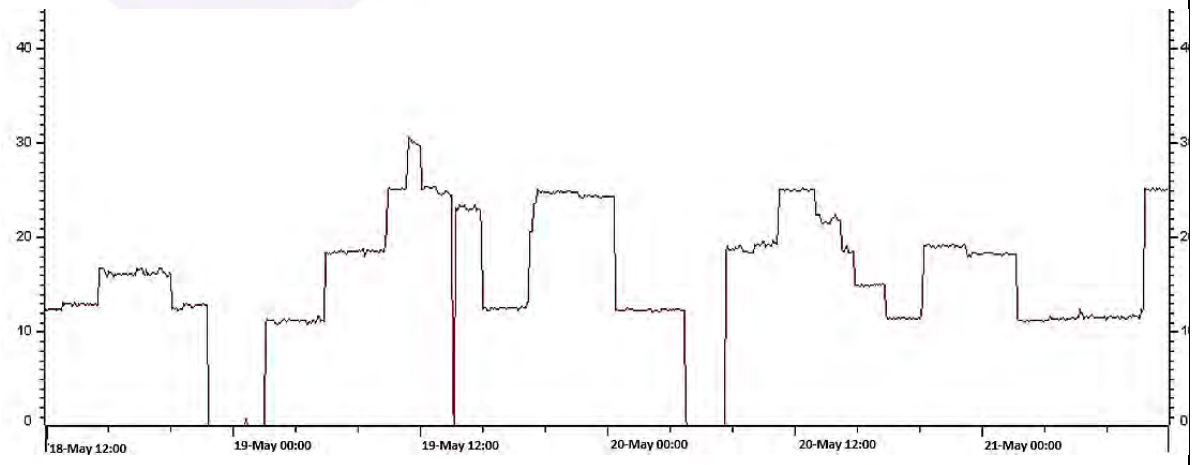
Which ONE of the following instruments would display this information?

Possible answers		Answer
a)	Dissolved oxygen analyser	
b)	Temperature transmitter	
c)	Human Machine Interface	
d)	pH probe	

Question 36

Refer to the trend analysis snapshot below of a pumping station.

On what day did the maximum flow rate occur?



Possible answers		Answer
a)	18 May	
b)	19 May	
c)	20 May	
d)	21 May	

Question 37

Refer to the image below.

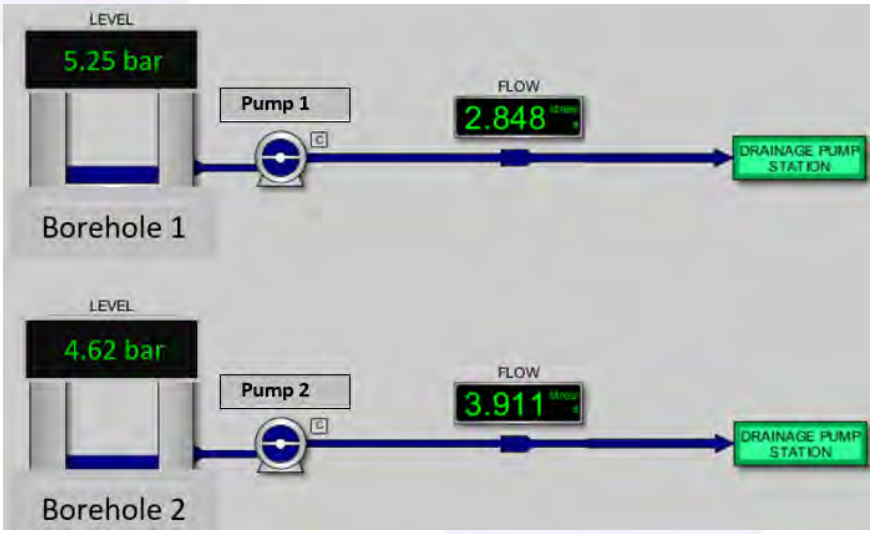
What measurement is the reading displaying?

Possible answers		Answer
a)	Signal velocity	
b)	Viscosity of a liquid	
c)	Capacitance Probe (RF)	
d)	Turbidity	

Question 38

Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH_2O, what is the current level in mH_2O of bore hole 1

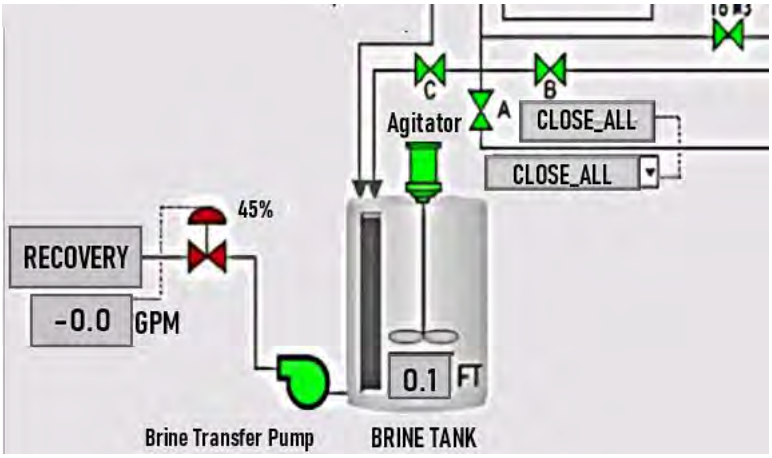


Possible answers		Answer
a)	29.04 mH_2O	
b)	39.9 mH_2O	
c)	47.1 mH_2O	
d)	53.5 mH_2O	

Question 39

Refer to the extract from a SCADA display.

Which ONE of the following figures is the flowrate from the brine tank to the Recovery?

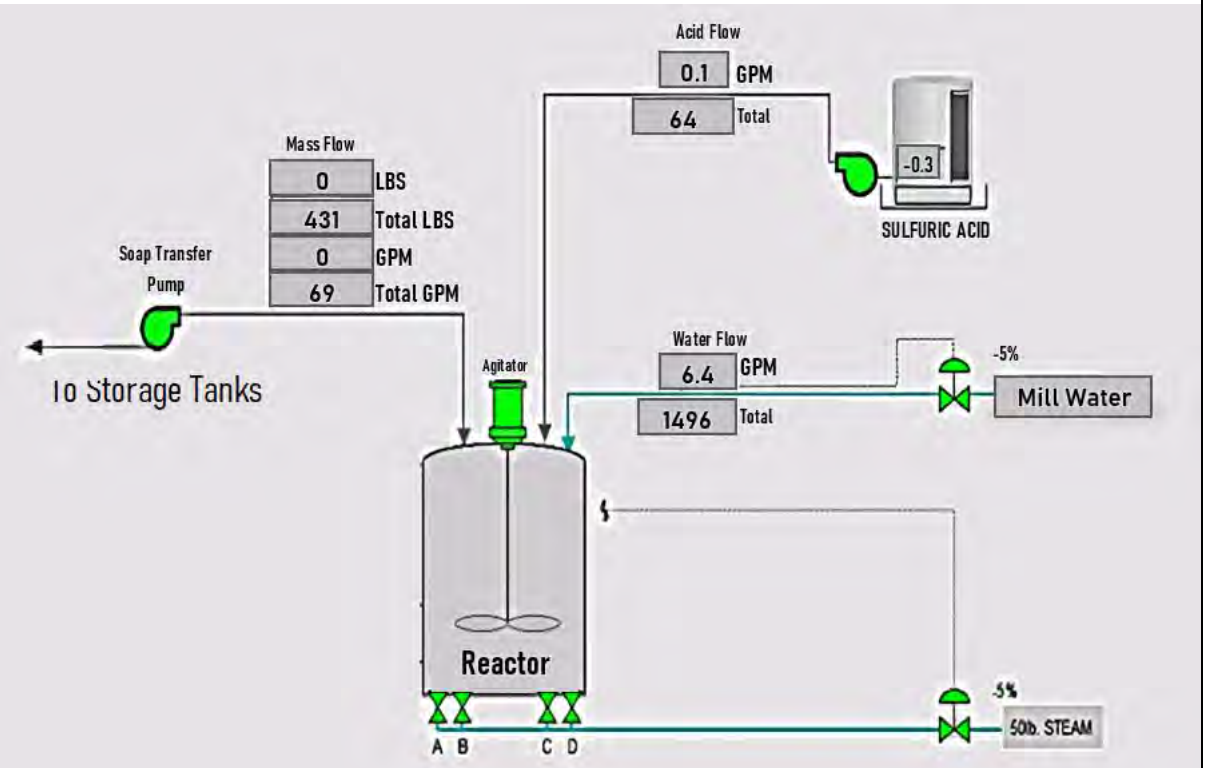


Possible answers		Answer
a)	-0.0 Gallons Per Minute	
b)	The information is not in the display	
c)	0.1 FT	
d)	45%	

Question 40

Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor.

What could prevent the water flow reaching the reactor?



Possible answers		Answer
a)	High levels in the storage tank	
b)	Open pneumatic valve	
c)	Blockage from the West Storage	
d)	Closed pneumatic valve	

End of Practice Knowledge Assessment

ENERGY & UTILITIES INDEPENDENT ASSESSMENT SERVICE

Practice Knowledge Assessment

Answer scheme

Question	Answer	Question	Answer	Question	Answer
1	D	**15**	B	**29**	B
2	C	**16**	D	**30**	B
3	B	**17**	C	**31**	D
4	C	**18**	D	**32**	D
5	B	**19**	B	**33**	B
6	D	**20**	B	**34**	B
7	A	**21**	C	**35**	A
8	D	**22**	C	**36**	B
9	B	**23**	C	**37**	D
10	A	**24**	A	**38**	D
11	D	**25**	C	**39**	A
12	B	**26**	A	**40**	D
13	A	**27**	A		
14	D	**28**	C		

Practice Assessment
Utilities Engineering Technician

Please write clearly in block capitals below	
Company name	
First name (s)	
Last name (s)	
Date of birth	
Apprentice signature	
Date of knowledge test	

Level: 3
Standard: Utilities Engineering Technician
Pathway: Mechanical

Duration: 1 hour

Materials

For this paper you must have:

- Pens
- Scientific calculator (non-programmable)

Instructions

- Use black ink or black ball-point pen
- Fill in the boxes at the top of this page
- Answer **all** questions
- There are questions, possible answers as well as a column for you to mark your answer
- Mark your answer with an ☒ against the possible answer you think is correct- if you wish to change your answer please put a line through ~~☒~~ and re-select with another ☒

- Only one answer per question allowed. Answers which do not follow the rules of selection will be disallowed. This may impact on the grade awarded
- Do all rough work in this answer book

Below is a Sample:

London is the capital of….

Example Question		
London is the capital of…		
Possible answers		**Answer**
a)	Wales	~~X~~
b)	Scotland	
c)	Northern Ireland	
d)	England	**X**

Information

- There are 40 questions
- All questions should be attempted
- The pass mark is 28

Advice

- Do not spend too long on one question
- Read all questions thoroughly before starting your examination
- Mobile phones and watches must not be taken into the examination room. The examination must be conducted under examination conditions
- Cheating: you will be asked to leave the examination room and will be classified an automatic failure and referred to your employer

Do not turn over the page or commence the knowledge test until the invigilator instructs you to

Question 1			
What type of safety sign is shown below?			
Possible answers		**Answer**	
a)	Mandatory		
b)	Warning		
c)	Prohibition		
d)	Emergency		

Question 2		
State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.		
Possible answers		**Answer**
a)	To decide how heavy chemical containers are	
b)	To collect information about employees' health	
c)	To decide how often to check chemical stock levels for re-ordering	
d)	To identify the potential for exposure to harmful material	

Question 3		
What is the first action that should be taken when assessing a potentially hazardous substance?		
Possible answers		**Answer**
a)	Provide appropriate PPE (Personal Protective Equipment)	
b)	Check the MSDS (Material Safety Data Sheet)	
c)	Check that there is space to store it safely	
d)	Conduct a risk assessment	

Question 4		
According to Health, Safety and Environment (HSE) guidelines which ONEof the following controls is the least effective?		
Possible answers		**Answer**
a)	Elimination	
b)	Engineering	
c)	PPE	
d)	Substitution	

Question 5		
Which ONE of the following activities must be completed before working in a confined space?		
Possible answers		**Answer**
a)	Ensure there is a safe system for working inside the space	
b)	Check the worker has the right qualification	
c)	Modify the area so entry is not necessary	
d)	Provide access and egress routes	

Question 6		
Which ONE of the following is commonly classed as safety-critical?		
Possible answers		**Answer**
a)	Fuse	
b)	Control valve	
c)	Steam trap	
d)	Drain valve	

Question 7		
Two technicians are working on the same piece of equipment which is isolated using a padlock. What safe isolation practice should be used?		
Possible answers		**Answer**
a)	Give each technician a key to the padlock	
b)	Use a multi padlock isolation tool	
c)	Leave the key tied to the padlock	
d)	Apply a long-term isolation	

Question 8		
Which ONE of the following regulations provide guidance on the use of handheld tools?		
Possible answers		**Answer**
a)	Control of Substances Hazardous to Health (COSHH)	
b)	Provision and Use of Work Equipment Regulations 1998 (PUWER)	
c)	Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)	
d)	Control of Major Accident Hazards Regulations 2015 (COMAH)	

Question 9		
In accordance with Health and Safety Executive (HSE) guidelines, which ONE of the following apply isolations?		
Possible answers		**Answer**
a)	Experienced people	
b)	Skilled people	
c)	Lead technicians	
d)	Authorised people	

Question 10		
In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?		
Possible answers		**Answer**
a)	The substance will give off a strong odour	
b)	The substance will have a label identifying the hazard	
c)	The substance will be contained in a glass receptacle	
d)	The substance will be in a red container	

Question 11		
What type of information is provided on the coloured tag on a piece of rigging equipment?		
Possible answers		**Answer**
a)	Certification period	
b)	Safe working load	
c)	Maximum working load	
d)	Safe to use	

Question 12		
What type of document should be fixed to a scaffold before use?		
Possible answers		**Answer**
a)	Risk assessment	
b)	Safety certificate	
c)	Permit to work	
d)	Approved Scafftag	

Question 13		
Assuming an emergency shower is close by, what should a technician do if they come into contact with hazardous substances whilst wearing a protective suit?		
Possible answers		**Answer**
a)	Remove all clothing and douse down under the shower	
b)	Stand under the shower immediately and douse down under the shower	
c)	Complete the task and then douse down under the shower	
d)	Stop work and immediately report to the first aid room	

Question 14		
A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?		
Possible answers		**Answer**
a)	19.5% - 23.5%	
b)	14% - 19%	
c)	6% - 14%	
d)	< 6%	

Question 15		
An operative is asked to carry out a task that will create dust. What will they need to do?		
Possible answers		**Answer**
a)	Dust is not a hazardous substance, so no safety measures are required	
b)	Wait until the wind is strong so it will blow the dust away	
c)	Wear the PPE identified on the permit or risk assessment	
d)	Only work for short periods and take regular breaks	

Question 16		
When working in these locations which one does **NOT** require a Confined Space Entry Permit?		
Possible answers		**Answer**
a)	Refrigeration Unit	
b)	Trench	
c)	Vessel	
d)	Ceiling Void	

Question 17		
Which ONE of the following must be tested before entering a confined space?		
Possible answers		
a)	Number of people wanting access	
b)	Oxygen content	
c)	Size of area	
d)	Noise levels	

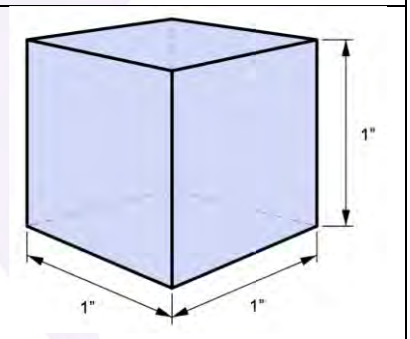
Question 18		
What is the correct order of working at height control measures?		
Possible answers		**Answer**
a)	1. Fall prevention 2. personal fall protection 3. avoid work at height 4. collective fall protection	
b)	1. Avoid work at height 2. fall prevention 3. collective fall protection 4. personal fall protection	
c)	1. Avoid work at height 2. collective fall protection 3. fall prevention 4. personal fall protection	
d)	1. Personal fall protection 2. collective fall protection 3. fall prevention 4. avoid work at height	

Question 19		
How regularly should electrical safety equipment be inspected?		
Possible answers		**Answer**
a)	Daily	
b)	Weekly	
c)	Monthly	
d)	Prior to use	

Question 20		
Which ONE of the following manual handling statements is true?		
Possible answers		**Answer**
a)	Correct manual handling prevents all accidents	
b)	Correct manual handling prevents damage to equipment	
c)	Correct manual handling should only be applied in the workplace	
d)	Correct manual handling reduces the risk of human injury	

Question 21		
In terms of psi (pound/square inch), what is 1 bar is equivalent to?		
Possible answers		**Answer**
a)	1.47 psi	
b)	14.7 psi	
c)	17.4 psi	
d)	147 psi	

Question 22		
What is the surface area of the cube in the image? The length of each side is 1 inch.		
Possible answers		**Answer**
a)	36 inches^2	
b)	6 inches^2	
c)	4 inches^2	
d)	1 inch^2	



Question 23		
What is the SI (International System of Units) name for force?		
Possible answers		**Answer**
a)	Hertz	
b)	PSI	
c)	Watts	
d)	Newton	

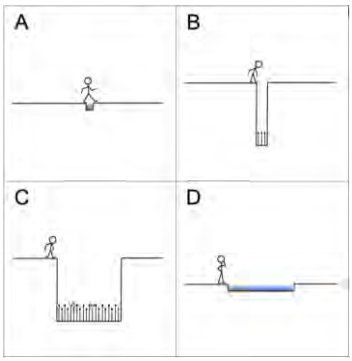
Question 24		
When seen on a flange, what does 150lb refer to?		
Possible answers		**Answer**
a)	Weight	
b)	Pressure rating	
c)	Cost code	
d)	Size	

Question 25		
Which ONE of the following definitions best fits the terminology 'specification'?		
Possible answers		**Answer**
a)	The capacity to withstand continuous force	
b)	The standard when measured against another object of similar design	
c)	A detailed description of the design and materials of an object	
d)	The specified point beyond which certification is invalid	

Question 26		
What does the symbol below represent when seen on a British Standard convention drawing? 		
Possible answers		**Answer**
a)	Electrical signal	
b)	Instrument signal	
c)	Hydraulic line	
d)	Pneumatic line	

Question 27		
Which of the following is **NOT** one of the elements needed to start a fire?		
Possible answers		**Answer**
a)	CO_2 (Carbon Dioxide)	
b)	Fuel	
c)	Heat	
d)	Oxygen	

Question 28		
Which type of maintenance schedule is more likely to lessen the likelihood of plant or equipment failure		
Possible answers		**Answer**
a)	Reactive maintenance	
b)	Risk based maintenance	
c)	Condition based maintenance	
d)	Preventative maintenance	

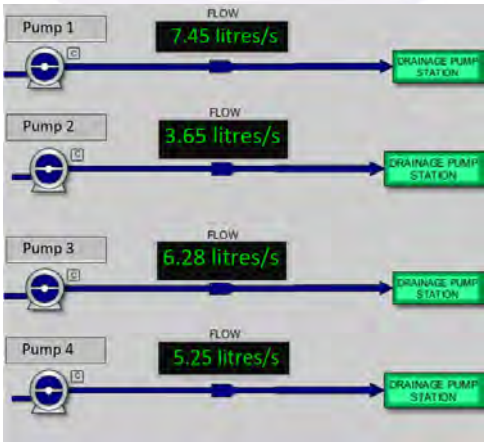
Question 29			
Looking at the image provided and taking into consideration risk, which task is low probability and low in impact?			
Possible answers		**Answer**	
a)	A	X	
b)	B		
c)	C		
d)	D		

Question 30		
What would be a typical sign that a filter was starting to become blocked?		
Possible answers		**Answer**
a)	Increase in differential pressure	
b)	Static differential pressure	
c)	Decrease in differential pressure	
d)	Zero differential pressure	

Question 31		
What is the metric SI (International System of Units) unit for torque?		
Possible answers		**Answer**
a)	Mn	
b)	Nm	
c)	Tq	
d)	N	

Question 32		
What type of maintenance is Root cause analysis?		
Possible answers		**Answer**
a)	Preventative	
b)	Reflective	
c)	Planned	
d)	Reactive	

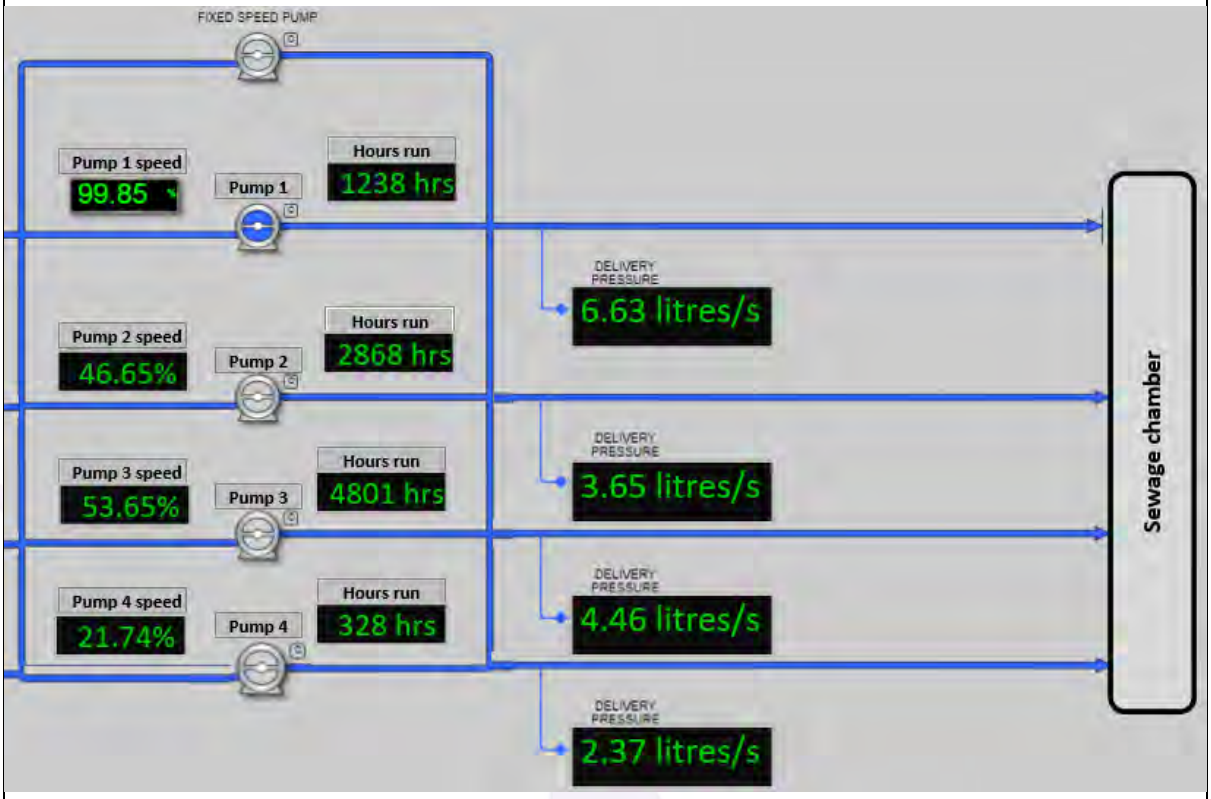
Question 33		
Refer to the diagram below. Calculate the difference between the flow rates of pump 1 and pump 4.		
Possible answers		**Answer**
a)	2.05 litres per second	
b)	2.20 litres per second	
c)	2.25 litres per second	
d)	3.25 litres per second	



Question 34

Refer to the display below.

Identify the average hours run time on the pump sets.



Possible answers		Answer
a)	3196.00 hours	
b)	2308.80 hours	
c)	55.47 hours	
d)	4.27 hours	

Question 35

Refer to the image below.

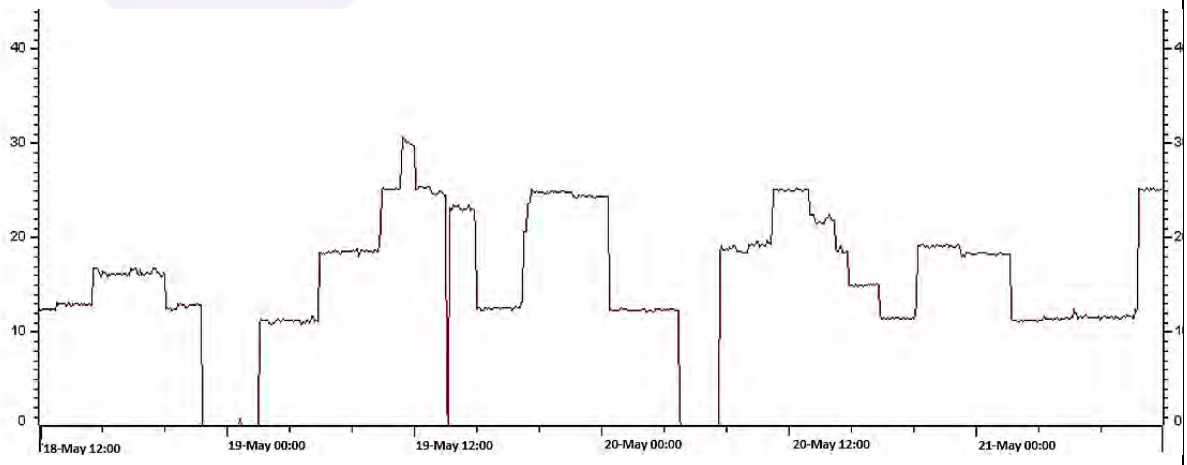
Which ONE of the following instruments would display this information?

Possible answers		Answer
a)	Dissolved oxygen analyser	
b)	Temperature transmitter	
c)	Human Machine Interface	
d)	pH probe	

Question 36

Refer to the trend analysis snapshot below of a pumping station.

On what day did the maximum flow rate occur?



Possible answers		Answer
a)	18 May	
b)	19 May	
c)	20 May	
d)	21 May	

Question 37

Refer to the image below.

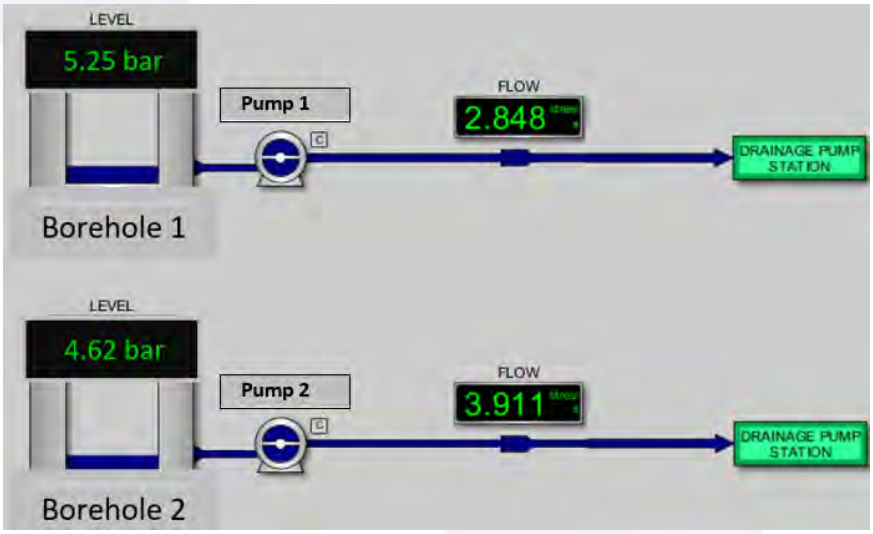
What measurement is the reading displaying?

Possible answers		Answer
a)	Signal velocity	
b)	Viscosity of a liquid	
c)	Capacitance Probe (RF)	
d)	Turbidity	

Question 38

Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH_2O, what is the current level in mH_2O of bore hole 1

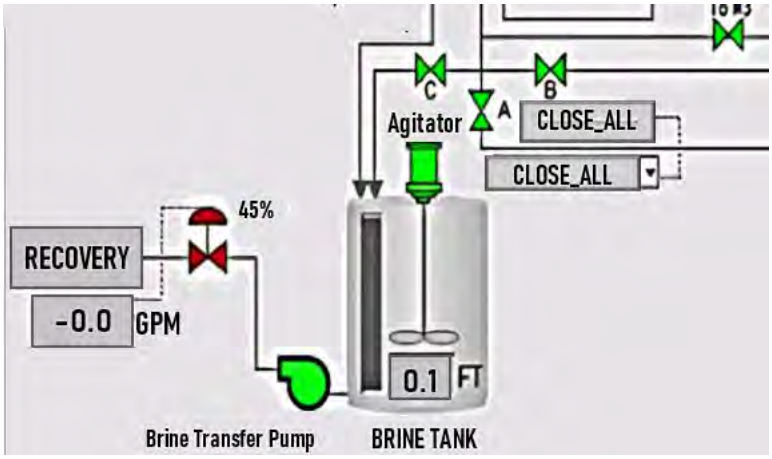


Possible answers		Answer
a)	29.04 mH_2O	
b)	39.9 mH_2O	
c)	47.1 mH_2O	
d)	53.5 mH_2O	

Question 39

Refer to the extract from a SCADA display.

Which ONE of the following figures is the flowrate from the brine tank to the Recovery?

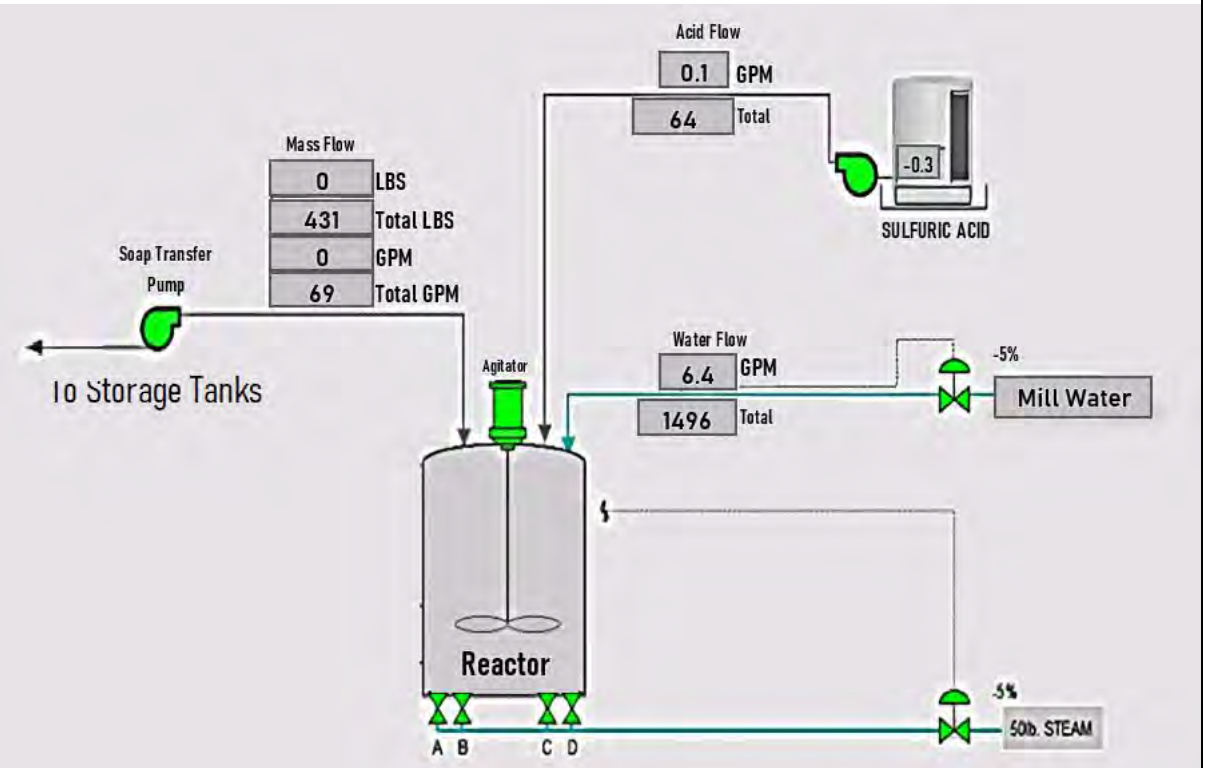


Possible answers		Answer
a)	-0.0 Gallons Per Minute	
b)	The information is not in the display	
c)	0.1 FT	
d)	45%	

Question 40

Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor.

What could prevent the water flow reaching the reactor?



Possible answers		Answer
a)	High levels in the storage tank	
b)	Open pneumatic valve	
c)	Blockage from the West Storage	
d)	Closed pneumatic valve	

End of Practice Knowledge Assessment

ENERGY & UTILITIES INDEPENDENT ASSESSMENT SERVICE

Practice Knowledge Assessment

Answer scheme

Question	Answer	Question	Answer	Question	Answer
1	B	**15**	C	**29**	A
2	D	**16**	D	**30**	A
3	B	**17**	B	**31**	B
4	C	**18**	B	**32**	D
5	A	**19**	D	**33**	B
6	A	**20**	D	**34**	B
7	B	**21**	B	**35**	A
8	B	**22**	B	**36**	B
9	D	**23**	D	**37**	D
10	B	**24**	B	**38**	D
11	A	**25**	C	**39**	A
12	D	**26**	D	**40**	D
13	B	**27**	A		
14	A	**28**	D		