

Skills for a greener world

Supporting Documents for

Level 3 Utilities Engineering Technician (Electrical; Mechanical; Instrumentation Control and Automation)

QAN 603/7317/9













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Level 3

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Automation)

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Updates to the supporting documents

Since the first publication of the EUIAS Water Process Technician (WPT) supporting documents, the following updates have been made.

Version	Date first published	Section updated	Page(s)
V2.1	July 2023	Practice papers: Image improvements	21, 43, 60, 65
V 2.0	June 2023	Rebranded	All
V1.0	March 20232	First published	All





Appendix A: Glossary

Amplification – provides more detail on how individual knowledge, skills or behaviours statements should be interpreted. Where the KSB statements, themselves are deemed self-explanatory, no amplification is provided. Assessment may include questions on anything identified in the amplification

Behaviours (as part of KSBs) – specific mindsets, attitudes or approaches identified as part of the apprenticeship standard that must be evidenced during endpoint assessment

Elements – are the knowledge, skills and behaviours and what is needed to competently undertake the duties required for an occupational standard **Guidance** – is only provided where it is required to support interpretation of the KSB statements

Gateway - the stage of the apprenticeship where the apprentice, employer and trainer determine whether the apprentice is ready to undertake the End-Point Assessment

Knowledge (as part of KSBs) – specific information, technical detail, and 'knowhow' identified as part of the apprenticeship standard that must be evidenced during end-point assessment

Options/Pathways – a specialist route within an occupational standard that builds on the occupational competence for a new entrant to the occupation

Skills (as part of KSBs) – the practical application of knowledge identified as part of the apprenticeship standard that must be evidenced during end-point assessment **Standard** – An occupational standard is a description of an occupation. It contains occupational profile, and describes KSBs needed for someone to be competent in the occupation's duties. The occupational standards are developed by employers for occupations that meet the Institute's current occupation criteria

Topic - is a collection of elements grouped into a theme e.g., Health and Safety



Appendix B: Gateway Eligibility Form

(Standard Version: ST0159 version 1; Assessment Plan Version: AP03) Apprentice's details

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:	

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		



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Gateway Eligibility Declaration

Th	e apprentice, the employer	and the training provider must	sign this form to confirm that	
1.	1. The apprentice has completed the required on-programme elements of the			
	apprenticeship and is read	ly for end-point assessment wil	th EUIAS.	
2.	The apprentice will only su	Ibmit their own work as part of	end-point assessment.	
3.	All parties agree that end-	point assessment evidence ma	y be recorded and stored	
	by EUIAS for quality assur	ance purposes.	-	
4.	The apprentice has been of	on-programme for a minimum o	luration of 365 days.	
5.	The apprentice has achiev	red English and maths Level 2	as detailed in this	
	document.			
6.	The apprentice has produce	ced a portfolio which includes a	a mapping document. The	
	mapping document has be	en placed at the front of the we	ork log and submitted to	
	EUIAS.			
7.	EUIAS has been informed	about any reasonable adjustm	ent and/or special	
	considerations requests.			
8.	The apprentice, if success	ful, gives permission for EUIAS	S to request the	
	apprenticeship certificate t	rom the ESFA who issue the c	ertificate on behalf of the	
	Secretary of State.		Deliev and Compleints	
9.	The apprentice has been of	directed to the EUIAS Appeals	Policy and Complaints	
10	Policy.	ider has given the FLUAS at la	ant three menths' notice	
	of requesting this EPA for	this apprentice		
11	If the Gateway Eligibility R	enort is not completed in full n	peeting all requirements	
	and submitted to FUIAS t	he end-point assessment cann	ot take place	
Si	and on behalf of the	Signature:		
en	nplover (print name)	Signature.		
Si	gned on behalf of the	Signature:	Date:	
tra	aining provider (print			
na	ime):			
Ap	oprentice's name (print):	Signature:	Date:	
L				

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

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Appendix C: Practice Tests

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Level: 3

Utilities Engineering Technician Pathway: Electrical Paper Code: PRACTICE PAPER

This examination consists of 40 multiple-choice questions.

The Pass mark is 28 correct answers.

The duration of this examination is 60 minutes.

You must use a pencil to complete the answer sheet - pens must NOT be used. When completed, please leave the examination answer sheet and question paper on the desk.

For this paper the use of a scientific calculator (non programmable) is permitted.

For each question, fill in ONE answer ONLY.

If you make a mistake, ensure you erase it thoroughly.

You must mark your choice of answer by shading in ONE answer circle only. Please mark each choice like this:

- ANSWER COMPLETED CORRECTLY

Examples of how NOT to mark your examination answer sheet. These will not be recorded.



This paper must be returned to EUIAS with the apprentice answer sheets.



You may use this page for rough work

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

Ques	stion 2		
State Regu	State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.		
Poss	ible Answers		
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		

Ques	Question 3		
In the	In the image below, what does the red sign mean?		
Poss	ible Answers		
a)	Mandatory behaviour		
b)	Prohibited behaviour		
c)	Information	~6~	
d)	Warning		



Which ONE of the following locations does **NOT** require a Confined Space Entry Permit?

Possible Answers	
a)	Refrigeration Unit
b)	Trench
c)	Vessel
d)	Ceiling Void

Ques	stion 5	
What	t is the correct order of working at	height control measures?
Poss	sible Answers	
a)	 Fall prevention personal fall protection avoid work at height collective fall protection 	
b)	 Avoid work at height fall prevention collective fall protection personal fall protection 	
c)	 Avoid work at height collective fall protection fall prevention personal fall protection 	
d)	 Personal fall protection collective fall protection fall prevention avoid work at height 	



Question 6Which ONE of the following manual handling statements is accurate?Possible Answersa)Correct manual handling prevents all accidentsb)Correct manual handling prevents damage to equipmentc)Correct manual handling should only be applied in the workplaced)Correct manual handling reduces the risk of human injury

Ques	stion 7
Whick	h ONE of the following regulations provide guidance on the use of handheld
Poss	ible Answers
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)

Ques	tion 8	
Which ONE of the following activities must be completed before working in a confined space?		
Possible Answers		
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	



Ques	Question 9	
Which ONE of the following is commonly classed as safety-critical?		
Possible Answers		
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		
a)	Experienced people	
b)	Skilled people	
c)	Lead technicians	
d)	Authorised people	

Ques	Question 11	
In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?		
Possible Answers		
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	



Ques	tion 12	
What type of information is provided on the coloured tag on a piece of rigging equipment?		
Possible Answers		
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		
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		
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	



A gas test has been completed within a confined space.

Which oxygen reading would allow safe entry into the confined space?

Possible Answers

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		
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	



What is the first action that should be taken when assessing a potentially hazardous substance?

Possible Answers

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		
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		
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	



When two waves of the same frequency have the opposite phase, what is the phase angle between them?

Possible Answers	
a)	0°
b)	90°
c)	180°
d)	360°

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

[Please turn over for Question 23]



Ques	Question 23	
In a control system, what does the transducer do?		
Possible Answers		
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	

Ques	Question 24	
What is the formula for working out wattage?		
Possible Answers		
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	
a)	0.5 volts
b)	2 volts
c)	18 volts
d)	72 volts



What device is created when an insulated wire in an electrical circuit is wrapped around an iron core?

Possible Answers	
a)	Electromagnet
b)	Motor
c)	Generator
d)	Magnet

Question 27		
On ar	n electrical equipment label, what	does the term 'd' refer to?
	CE 0477 (Ex) II 2	G Exd IC T4 Gb
Poss	Possible Answers	
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	
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 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	
a)	Mn
b)	Nm
c)	Тq
d)	Ν

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



What does the symbol below represent when seen on a British Standard convention drawing?

Possible Answers

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	
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. FIXED SPEED PUMP Hours run Pump 1 speed 1238 hrs Pump 1 99.85 DELIVERY 6.63 litres/s Hours run Pump 2 speed 2868 hrs Pump 2 Sewage chamber 46.65% DELIVERY Hours run Pump 3 speed .65 litres/s 4801 hrs Pump 3 53.65% Hours run Pump 4 speed 4.46 litres/s 328 hrs Pump 4 21.74% DELIVERY 2.37 litres/s **Possible Answers** 3196.00 hours a) 2308.80 hours b) 55.47 hours c) 4.27 hours d)



Refer to the image below.

Which ONE of the following instruments would display this information?

Poss	ible Answers		
a)	Dissolved oxygen analyser	0.04	
b)	Temperature transmitter	8.94 ppm	
c)	Human Machine Interface	19.3 Deg C	
d)	pH probe		

Question 36

Refer to the image below.

What measurement is the reading displaying?

Poss	Possible Answers		
a)	Signal velocity		
b)	Viscosity of a liquid	1 8/	
c)	Capacitance Probe (RF)	I.OT NTU	
d)	Turbidity		

[Please turn over for Question 37]





[Please turn over for Question 38]



Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH2O, what is the current level in mH2O of bore hole 1

	LEVEL 5.25 bar Pump 1 C Borehole 1	PLOW 2.848 Trees
	LEVEL 4.62 bar Pump 2 C Borehole 2	FLOW 3.911 STORE DRAINAGE PUMP STATION
Poss	ible Answers	
a)	29.04 mH2O	
b)	39.9 mH2O	
c)	47.1 mH2O	
d)	53.5 mH2O	

[Please turn over for 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?



[Please turn over for 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?



End of Questions

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Answers

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



Level: 3

Utilities Engineering Technician Pathway: Mechanical Paper Code: PRACTICE PAPER

This examination consists of 40 multiple-choice questions.

The Pass mark is 28 correct answers.

The duration of this examination is 60 minutes.

You must use a pencil to complete the answer sheet - pens must NOT be used. When completed, please leave the examination answer sheet and question paper on the desk.

For this paper the use of a scientific calculator (non programmable) is permitted.

For each question, fill in ONE answer ONLY.

If you make a mistake, ensure you erase it thoroughly.

You must mark your choice of answer by shading in ONE answer circle only. Please mark each choice like this:

- ANSWER COMPLETED CORRECTLY

Examples of how NOT to mark your examination answer sheet. These will not be recorded.

 1
 Image: Constraint of the system of the

This paper must be returned to EUIAS with the apprentice answer sheets.



You may use this page for rough work

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Ques	stion 1	
What	type of safety sign is shown below?	
Poss	ible Answers	
a)	Mandatory	
b)	Warning	
c)	Prohibition	
d)	Emergency	

Ques	Question 2		
State Regu	State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.		
Poss	ible Answers		
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		

Ques	Question 3		
What hazar	What is the first action that should be taken when assessing a potentially hazardous substance?		
Poss	Possible Answers		
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		



According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?

Possible Answers

a)	Elimination
b)	Engineering
c)	PPE
d)	Substitution

Ques	Question 5		
Whicl confir	Which ONE of the following activities must be completed before working in a confined space?		
Poss	ible Answers		
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		

Ques	Question 6	
Whicl	h ONE of the following is commonly classed as safety-critical?	
Poss	ible Answers	
a)	Fuse	
b)	Control valve	
c)	Steam trap	
d)	Drain valve	



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		
Give each technician a key to the padlock		
Use a multi padlock isolation tool		
Leave the key tied to the padlock		
Apply a long-term isolation		

Ques	Question 8	
Whic tools	h ONE of the following regulations provide guidance on the use of handheld ?	
Poss	ible Answers	
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				
a)	Experienced people			
b)	Skilled people			
c)	Lead technicians			
d)	Authorised people			
-				



In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?

Possible Answers

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				
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				
a)	Risk assessment			
b)	Safety certificate			
c)	Permit to work			
d)	Approved Scafftag			



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 Answersa)Remove all clothing and douse down under the showerb)Stand under the shower immediately and douse down under the showerc)Complete the task and then douse down under the showerd)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				
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			
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		


Which ONE of the following locations does **NOT** require a Confined Space Entry Permit?

Possible Answers		
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	

[Please turn over for Question 18]



Question 18			
What	What is the correct order of working at height control measures?		
Poss	ible Answers		
a)	 Fall prevention personal fall protection avoid work at height collective fall protection 		
b)	 Avoid work at height fall prevention collective fall protection personal fall protection 		
c)	 Avoid work at height collective fall protection fall prevention personal fall protection 		
d)	 Personal fall protection collective fall protection fall prevention avoid work at height 		

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



Question 20		
Which ONE of the following manual handling statements is accurate?		
Possible Answers		
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 ter	In terms of psi (pound/square inch), what is 1 bar is equivalent to?		
Possible Answers			
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 l	The length of each side is 1 inch.		
Possible Answers			
a)	36 inches ²		
b)	6 inches ²	1"	
c)	4 inches ²		
d)	1 inch ²		



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

Question 24		
When seen on a flange, what does 150lb refer to?		
Possible Answers		
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		
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	



What does the symbol below represent when seen on a British Standard convention drawing?

Possible Answers

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		
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		
a)	Reactive maintenance	
b)	Risk based maintenance	
c)	Condition based maintenance	
d)	Preventative maintenance	



Looking at the image provided and taking into consideration risk, which task is low probability and low in impact?



Ques	Question 30		
What would be a typical sign that a filter was starting to become blocked?			
Possible Answers			
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		
a)	Mn	
b)	Nm	
c)	Тq	
d)	Ν	

Ques	Question 32		
What	What type of maintenance is root cause analysis?		
Poss	Possible Answers		
a)	Preventative		
b)	Reflective		
c)	Planned		
d)	Reactive		

[Please turn over for Question 33]



Refer to the diagram below.

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



Poss	Possible Answers				
a)	2.05 litres per second				
b)	2.20 litres per second				
c)	2.25 litres per second				
d)	3.25 litres per second				

[Please turn over for Question 34]



Question 34 Refer to the display below. Identify the average hours run time on the pump sets. FIXED SPEED PUMP Hours run Pump 1 speed 1238 hrs Pump 1 99.85 DELIVERY 6.63 litres/s Hours run Pump 2 speed 2868 hrs Pump 2 Sewage chamber 46.65% DELIVERY Hours run Pump 3 speed .65 litres/s 4801 hrs Pump 3 53.65% Hours run Pump 4 speed 4.46 litres/s 328 hrs Pump 4 21.74% DELIVERY 2.37 litres/s **Possible Answers** 3196.00 hours a) 2308.80 hours b) 55.47 hours c) 4.27 hours d)



Refer to the image below.

Which ONE of the following instruments would display this information?

Poss	ible Answers		
a)	Dissolved oxygen analyser	0.04	
b)	Temperature transmitter	8.94 ppm	
c)	Human Machine Interface	19.3 Deg C	
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				
a)	18 May			
b)	19 May			
c)	20 May			
d)	21 May			



Refer to the image below.

What measurement is the reading displaying?

Possible Answers

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



[Please turn over for Question 38]





Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH2O, what is the current level in mH2O of bore hole 1

	LEVEL 5.25 bar Pump 1 2.848 Borehole 1
	LEVEL 4.62 bar Pump 2 3.911 total DRAINAGE PUMP STATION Borehole 2
Poss	ible Answers
a)	29.04 mH2O
b)	39.9 mH2O
c)	47.1 mH2O
d)	53.5 mH2O

[Please turn over for 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?



[Please turn over for 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?



End of Questions



Answers

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



Level: 3

Utilities Engineering Technician Pathway: Instrumentation Control and Automation Paper Code: PRACTICE PAPER

This examination consists of 40 multiple-choice questions.

The Pass mark is 28 correct answers.

The duration of this examination is 60 minutes.

You must use a pencil to complete the answer sheet - pens must NOT be used. When completed, please leave the examination answer sheet and question paper on the desk.

For this paper the use of a scientific calculator (non programmable) is permitted.

For each question, fill in ONE answer ONLY.

If you make a mistake, ensure you erase it thoroughly.

You must mark your choice of answer by shading in ONE answer circle only. Please mark each choice like this:

- ANSWER COMPLETED CORRECTLY

Examples of how NOT to mark your examination answer sheet. These will not be recorded.



This paper must be returned to EUIAS with the apprentice answer sheets.



You may use this page for rough work



Question 1How regularly should electrical safety equipment be inspected?Possile Answersa)Dailyb)Weeklyc)Monthlyd)Prior to use

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

Question 3				
What	type of safety sign is shown below?			
Poss	ible Answers			
a)	Mandatory			
b)	Warning			
c)	Prohibition			
d)	Emergency			



According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?

Possible Answers

a)	Elimination
b)	Engineering
c)	PPE
d)	Substitution

Question 5		
What is the first action that should be taken when assessing a potentially hazardous substance?		
Possible Answers		
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 6State ONE purpose of completing a Control of Substances Hazardous to Health
Regulations (COSHH) assessment in the workplace.Possible Answersa)To decide how heavy chemical containers areb)To collect information about employees' healthc)To decide how often to check chemical stock levels for re-orderingd)To identify the potential for exposure to harmful substances



A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?

Possible Answers

a)	19.5% - 23.5%
b)	14% - 19%
c)	6% - 14%
d)	< 6%

Question 8			
What	What does this green sign mean?		
Poss	ible Answers		
a)	Prohibited behaviour		
b)	Warning		
c)	Mandatory behaviour		
d)	Information		

Question 9			
Whick	Which ONE of the following regulations provide guidance on the use of handheld		
tools?			
Possible Answers			
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		
Whicl	Which ONE of the following is commonly classed as safety-critical?	
Possible Answers		
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 can apply isolations?		
Possible Answers		
a)	Experienced people	
b)	Skilled people	
c)	Lead technicians	
d)	Authorised people	

Ques	Question 12	
In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?		
Possible Answers		
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	



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

Ques	Question 14		
What	What type of document should be fixed to a scaffold before use?		
Possible Answers			
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		
a)	Refrigeration unit	
b)	Trench	
c)	Vessel	
d)	Ceiling void	

Ques	Question 17		
An op	operative is asked to carry out a task that will create dust.		
What	What will they need to do?		
Possible Answers			
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 accurate?		
Possible Answers		
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	



Ques	stion 19			
What	What is the correct order of working at height control measures?			
Poss	ible Answers			
a)	 Fall prevention personal fall protection avoid work at height collective fall protection 			
b)	 Avoid work at height fall prevention collective fall protection personal fall protection 			
c)	 Avoid work at height collective fall protection fall prevention personal fall protection 			
d)	 Personal fall protection collective fall protection fall prevention avoid work at height 			

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		
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	



Ques	Question 21		
Whicl	Which ONE of the following definitions best fits the terminology 'specification'?		
Possible Answers			
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? R1 R3 R1 R3 R1 R3 R2 V R4 Possible Answers a) 2000 Ω b) 500 Ω

5)	000 12	
c)	450 Ω	
d)	250 Ω	



Ques	Question 23		
What is the formula for Ohms law?			
Possible Answers			
a)	$I = R \times V$		
b)	I = R ÷ V		
c)	I = V ÷ R		
d)	$I = V \times R$		

Question 24				
Look prob	Looking at the image provided and taking into consideration risk, which task is low probability and low in impact?			
Pos	sible answers	Α		В
a)	А		<u>}</u>	
b)	В	0		
c)	С			
d)	D	Į		



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

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		
a)	14 mA	
b)	12 mA	
c)	10 mA	
d)	8 mA	

[Please turn over for Question 27]



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

Ques	Question 28		
What is the most common output range of a pneumatic transmitter?			
Possible Answers			
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 c	In a control system, what does the transducer do?		
Possible Answers			
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	
a)	Mn
b)	Nm
c)	Тq
d)	Ν

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

What does the symbol below represent when seen on a British Standard convention drawing?

Possible Answers		
a)	Electrical signal	
b)	Instrument signal	
c)	Hydraulic line	- // // // //
d)	Pneumatic line	



Refer to the diagram below.

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



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

[Please turn over for Question 34]







Refer to the image below.

Which ONE of the following instruments would display this information?

Possible Answers			
a)	Dissolved oxygen analyser	0.04	
b)	Temperature transmitter	8.94 ppm	
c)	Human Machine Interface	19.3 Deg C	
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		
a)	18 May	
b)	19 May	
c)	20 May	
d)	21 May	



Refer to the image below.

What measurement is the reading displaying?

Possible Answers

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



[Please turn over for Question 38]





Refer to the display below.

If 1.0 bar of pressure equals approximately 10.1972 mH2O, what is the current level in mH2O of bore hole 1

	LEVEL 5.25 bar Pump 1 2.848 Borehole 1
	LEVEL 4.62 bar Pump 2 3.911 total DRAINAGE PUMP STATION Borehole 2
Poss	ible Answers
a)	29.04 mH2O
b)	39.9 mH2O
c)	47.1 mH2O
d)	53.5 mH2O

[Please turn over for 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?



[Please turn over for 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?



End of Questions


Answers

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



Appendix D: Interview Grading with Portfolio Mapping

Introduction

Throughout the on-programme part of the apprenticeship, the apprentice will need to keep compile a portfolio of evidence to support the requirements of the interview.

The evidence within the portfolio will need to be mapped to the KSB requirements using the mapping document overleaf.

The independent assessor will use the mapping document to review the evidence in their portfolio in preparation for the interview. The independent assessor will not assess the portfolio.

The portfolio mapping document below consists of

- pages covering mapping for core requirements
- pages covering mapping for the electrical option
- page covering mapping for the mechanical option
- page covering mapping for the ICA option

Apprentices should use the mapping for the core and the option they are following.

Apprentice's next steps

- 1. Complete all the details on the first page and include employer details of where relevant competencies from their experience at work was gained
- 2. Ensure each piece of evidence signed off by their tutor/supervisor/mentor and training provider. The apprentice can use a number of different types of evidence to demonstrate their competence as described in Section 6 of the Specification 'What to include in the portfolio'. For further guidance, the apprentice must seek advice from their tutor/supervisor/mentor and training provider
- 3. Map evidence to the criteria in the following pages using a referencing system indicating where the evidence for the criteria is located in the portfolio e.g., work based evidence Job 1 (J1) page 5 paragraph 2. This will allow the independent assessor to locate the section or specific piece of evidence being discussed and referred to during the interview
- 4. Place the portfolio mapping document at the front of the portfolio of evidence.



The apprentice's training provider must make arrangements for EUIAS to have access to the apprentice's portfolio including the portfolio mapping document at Gateway. For those using e-portfolios such as ONEFILE or SMARTASSESSOR, the reference used must simply be the file or folder name you used when uploading the evidence to such systems.



Interview Grading with Portfolio Mapping Mapping Sign off on Portfolio Completion:

Apprentice Name (Print)	Apprentice Signature	Training Provider (Company)	Training Provider Signatory	Date of Sign Off

Pathway

GROUP 1: (Core) Health & safety

Pass Criteria 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

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		LIO CE
		(Appr	entice	Input)
		1	2	3
B4ii	Accept, allocate and supervise technical and other			
	tasks			

GROUP 2: (Core) Make components

Pass Criteria Describes how they have used workshop machinery and equipment to create,

repair and modify component and apparatus appropriately

Ref.	Apprenticeship Standard Criteria	PC E' RE (Appr	ORTFOL VIDENC FEREN rentice	.IO E CE Input)
		1	2	3
S5	Use workshop machinery and equipment to create, repair and modify component and apparatus			



GROUP 3: (Core) Communicate

Pass	Pass Criteria					
Desc	ribes how they communicate with contractors and suppl	iers and	l provide	e		
inforr	nation and guidance in line with personal role and respo	onsibilitie	es			
		PC	RTFOL	.10		
		E	EVIDENCE			
Ref.	Apprenticeship Standard Criteria	REFEREN		ICE		
		(Apprentice Input)123	nput)			
			3			
	Communicate with and provide information and					
S7ii	guidance to contractors, suppliers in line with					
	personal role and responsibilities					

GROUP 4: (Core) Work allocation/ supervision

Pass Criteria

Describes how they have managed tasks, including delegation and supervision Describes how their contributions to a team project made a difference, whilst working to approved standards and safe working practices

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Inpu		.IO E CE Input)
		1	2	3
R ∕iii	Accept, allocate and supervise technical and other			
Dfil	tasks			
B9	Work effectively and safely when undertaking tasks			
	to approved standards and safe working practices as			
	part of a team or with appropriate supervision			



GROUP 5: (Core) Professionalism

Pass Criteria

Describes how they have delivered a polite, courteous and professional service to customers and members of the public

Ref.	Apprenticeship Standard Criteria	EVIDENCE REFERENC (Apprentice In		.IO E CE Input)
		1	2	3
В3	Deliver a polite, courteous professional service to customers and members of the public			
B7ii	Be professional in work and in personal standards			

GROUP 6: (Core) Diversity and equality

Pass Criteria

Describes how they have taken account of the needs and concerns of others in relation to diversity and equality

Ref.	Apprenticeship Standard Criteria	PC E RE (Appi	ORTFOL VIDENC FEREN rentice	.IO CE CE Input)
		1	2	3
B 10	Be aware of the needs and concerns of others,			
ы	especially where related to diversity and equality			

GROUP 7: (Core) Continued professional development

Pass Criteria

Describes the CPD activities they have completed and explains how it enhanced their competence

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE		.IO E CE
		(Appr	entice	nput)
		1	2	3
B11	Carry out and record CPD necessary to maintain and			
	enhance competence			



GROUP 8: (Core) Ethical manner

Pass Criteria					
Desc	ribes how they exercise responsibilities in an ethical ma	nner			
		PORTFOLIO EVIDENCE			
Ref.	Apprenticeship Standard Criteria	REFERENCE(Apprentice Input)123			
			nput)		
			3		
B12	Exercise responsibilities in an ethical manner				

GROUP 9: (Electrical) Duties

Pass Criteria

Describes how they have applied technical knowledge in their electrical duties: inspecting, condition monitoring and reporting; and testing servicing/maintaining and repairing electrical equipment

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

Ref.	Apprenticeship Standard Criteria	PC E` RE (Appr	ORTFOL VIDENC FEREN rentice I	IO E CE nput)
		1	2	3
S1	Apply technical knowledge to carry out inspections, condition monitoring and reporting.			
S12	Drive vehicles equipped with tools and materials to job sites.			
S14	As required, undertake standby duties to provide 24- hour cover to remedy fault situations requiring diagnostic testing procedures.			
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.			
E7	Test, service and repair electrical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.			



GROUP 10: (Electrical) Electrical installation and commission of clean/wastewater equipment

Pass Criteria

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

Distinction Criteria

Identifies and explains the potential issues that could arise during the work and how they mitigate against them

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input		.IO E CE Input)
		1	2 3	3
6420	Install replace and commission equipment and			
5151	components as required			
E2				
E6				
E8				



GROUP 11: (Electrical) Electrical fault finding and repair

Pas	Pass Criteria					
Des	Describes how they have located, diagnosed and rectified faults on					
Prog	grammable Logic Controllers					
(PLC	C) and Supervisory Control & Data Acquisition					
(SC	ADA) systems or similar					
Exp	lains how they consulted design specifications to analys	e and c	alculate			
elec	trical system parameters and rectification procedures					
Dist	inction Criteria					
Des	cribes different fault-finding methods they have used, ju	stifying	their cho	oices		
		PC	ORTFOL	.10		
	Apprenticeship Standard Criteria		EVIDENCE			
Ref.			REFERENCE			
		(Apprentice Input)				
		(Appr	entice	input)		
		(Appr 1	2	3		
КА	Locate, diagnose and rectify faults on plant and	(Appr 1	2	3		
К4	Locate, diagnose and rectify faults on plant and equipment.	(Appr 1	2	3		
K4	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location,	(Appr 1	2	3		
K4 S3	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location, diagnosis and rectification of faults.	(Appr 1	2	3		
K4 S3	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location, diagnosis and rectification of faults. Consult design specifications to analyse and	(Appr 1	2	3		
K4 S3 E5	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location, diagnosis and rectification of faults. Consult design specifications to analyse and calculate electrical system parameters and	(Appr 1	2	3		
K4 S3 E5	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location, diagnosis and rectification of faults. Consult design specifications to analyse and calculate electrical system parameters and rectification procedures.	(Appr 1	2	3		
K4 S3 E5	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location, diagnosis and rectification of faults. Consult design specifications to analyse and calculate electrical system parameters and rectification procedures. Carry out basic fault diagnostics on Programmable	(Appr 1	2	3		
K4 S3 E5 E10	Locate, diagnose and rectify faults on plant and equipment. Principles and processes that underpin the location, diagnosis and rectification of faults. Consult design specifications to analyse and calculate electrical system parameters and rectification procedures. Carry out basic fault diagnostics on Programmable Logic Controllers (PLC) and Supervisory Control &	(Appr 1	2	3		



GROUP 9: (Mechanical) Duties

Pass	Criteria					
Describes how they have applied technical knowledge in their mechanical duties:						
inspecting, condition monitoring and reporting, testing, installing, dismantling,						
repai	repairing mechanical equipment and components					
Desc	ribes different types of complex plant, machinery and co	mponer	nts they	have		
worke	ed on including motors, pumps and gear boxes					
If app	propriate to the apprentice's workplace, describes their r	ole in dr	iving ve	hicles		
equip	ped with tools and materials to job sites					
If app	propriate to the apprentice's workplace, describes how the	ney prov	vide 24 ł	nour		
cover	⁻ to remedy fault situations requiring diagnostic testing p	rocedur	es			
		PC	RTFOL	.10		
		E	VIDENC	E		
Ref.	Apprenticeship Standard Criteria	RE	FEREN	CE		
		(Appr	entice	Input)		
		1	2	3		
S1	Apply technical knowledge to carry out inspections,					
	condition monitoring and reporting					
S12	Drive vehicles equipped with tools and materials to					
•	job sites.					
	As required, undertake standby duties to provide 24-					
S14	hour cover to remedy fault situations requiring					
	diagnostic testing procedures					
	Inspect and monitor mechanical systems, and					
M2ii	inspect, monitor, dismantle and repair mechanical					
	equipment and components.					
	Use mechanical knowledge and skills to install,					
M5	maintain and dismantle a wide range of complex					
	plant, machinery and components.					
MO::	Repair mechanical equipment as part of planned					
ININI	preventative maintenance and/or reactive		_			
	maintenance programmes.					
MO	install and maintain mechanical components					
INIA	and replacing lubricente					
M10	Inspect and maintain condition monitoring equipment					



GROUP 10: (Mechanical) Mechanical installation and commission of clean/ wastewater

equipment

Pass	Criteria			
Explai	ns how they have installed/repositioned, replaced, and	commis	sioned	
equipr	nent and components, including interpretation of plans	and tes	ting	
Descri	bes use of fabrication and welding appropriate to the ta	ask	-	
Distin	ction Criteria			
Identif	ies and explains the potential issues that could arise du	uring the	work a	nd
how th	ley mitigate against them	0		
		PC	ORTFOL	.10
			EVIDENCE	
Ref.	Apprenticeship Standard Criteria	REFERENCE		
_		(Apprentice Input)		
		(Appi	entice	mput)
		(App) 1	2	3
Q13 ii	Install replace and commission equipment and	(Appi 1	2	3
S13ii	Install replace and commission equipment and components as required	(App) 1	2	3
S13ii	Install replace and commission equipment and components as required Test mechanical equipment and systems and assist	(App) 1	2	3
S13ii M3	Install replace and commission equipment and components as required Test mechanical equipment and systems and assist in installing mechanical systems and equipment	(App) 1	2	3
S13ii M3	Install replace and commission equipment and components as required Test mechanical equipment and systems and assist in installing mechanical systems and equipment Basic fabrication and welding of structures and	(App) 1	2	3
S13ii M3 M4	Install replace and commission equipment and components as required Test mechanical equipment and systems and assist in installing mechanical systems and equipment Basic fabrication and welding of structures and components	(App) 1	2	3
S13ii M3 M4	Install replace and commission equipment and components as required Test mechanical equipment and systems and assist in installing mechanical systems and equipment Basic fabrication and welding of structures and components Interpret plans and drawings to install, position or re-	(App) 1	2	3



GROUP 11: (Mechanical) Mechanical fault finding and repair

Pass Criteria

Describes how they have located, diagnosed and rectified faults Explains how they consulted design specifications to analyse and calculate mechanical system parameters and rectification procedures

Distinction Criteria

Describes different fault-finding methods they have used, justifying their choices

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3
KA	Locate, diagnose and rectify faults on plant and			
N 4	equipment.			
63	Principles and processes that underpin the location,			
33	diagnosis and rectification of faults.			
М1	Apply mechanical theories and principles in order to			
	carry out diagnostic fault finding procedures.			
	Consult design specifications to analyse and			
M6	calculate mechanical system parameters and			
	rectification procedures.			



GROUP 9: (ICA) Duties

Pas	s Criteria					
Des	Describes how they have applied technical knowledge in their ICA duties:					
insp	inspecting, condition monitoring and reporting, testing telemetry outstation and					
inter	nal system configuration, inspecting and maintaining se	ecurity e	quipmeı	nt,		
teleo	communication devices and alarm systems, supporting	day-to-d	ay user	s of		
instr	umentation and control systems					
lf ap	propriate to the apprentice's workplace, describes their	role in c	driving			
vehi	cles equipped with tools and materials to job sites					
		PC	ORTFOL	.10		
		E	VIDENC	E		
Ref.	Apprenticeship Standard Criteria	RE	FEREN	CE		
		(Appr	entice	Input)		
		1	2	3		
S1	Apply technical knowledge to carry out inspections,					
	condition monitoring and reporting.					
S12	Drive vehicles equipped with tools and materials to					
	job sites.					
	As required, undertake standby duties to provide 24-					
S14	hour cover to remedy fault situations requiring					
	diagnostic testing procedures.					
15	Carry out telemetry outstation and internal system					
	configuration.					
16	Identify and resolve data quality and calibration					
	issues.					
19	Use standards and specifications to improve the					
	information gathered by telemetry data.					
112	Inspect and maintain security equipment,					
	telecommunication devices and alarm systems.					
113	Provide support to day-to-day users of					
	instrumentation and control systems.					



GROUP 10: (ICA) ICA installation and commission of clean/waste water equipment

Pass Criteria

Explains how they have installed, tested, replaced, calibrated and dismantled ICT equipment and components (controllers, probes, attachments, cabling, meters and display units)

Distinction Criteria

Identifies and explains the potential issues that could arise during the work and how they mitigate against them

Ref.	Apprenticeship Standard Criteria		PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)		
		1	2	3	
613 ii	Install replace and commission equipment and				
5131	components as required.				
	Test and calibrate instrumentation and control				
13	equipment and circuits and assist in installing				
	instrumentation and control equipment.				
	Use Instrumentation and Control Systems				
ин	knowledge and skills to install, maintain and				
1411	dismantle instruments, controllers, probes,				
	attachments, cabling, meters and display units.				



GROUP 11: (ICA) ICA fault finding and repair

Pass	Criteria				
Desc	Describes how they have located, diagnosed and rectified faults				
Desc	ribes how they have repaired instrumentation and contro	ol equip	ment an	d	
config	gured and calibrated field instrumentation, communicatio	on devic	es and		
asso	ciated equipment used in system and process control, s	uch as F	Program	mable	
Logic	Controllers (PLC) and Supervisory Control & Data Acq	uisition	(SCADA	()	
syste	ms				
Disti	nction Criteria				
Desc	ribes different fault-finding methods they have used, jus	tifying th	neir choi	ces	
		PC	RTFOL	.IO	
		E	VIDENC	E	
Ref.	Apprenticeship Standard Criteria		FEREN	CE	
			(Apprentice Input)		
			2	3	
KA	Locate, diagnose and rectify faults on plant and				
N 4	equipment.				
63	Principles and processes that underpin the location,				
3	diagnosis and rectification of faults.				
	Apply theories and principles of electronics to use				
11	equipment to carry out diagnostic fault finding				
	procedures.				
1211	Repair and overhaul instrumentation and control				
1211	equipment.				
	Repair, and configure field instrumentation,				
	communication devices and associated equipment				
IQiii	used in system and process control, such as				
10111	Programmable Logic Controllers (PLC) and				
	Supervisory Control & Data Acquisition (SCADA)				
	systems.				



Appendix E: Observation with Questions Planning Sheet

Instructions

The practical observation must be designed to meet the requirements of the UET standard and appropriate pathway (electrical/ instrumentation control & automation /mechanical).

- The apprentice is observed in their workplace. The apprentice completes their day-to-day duties under normal working conditions. This allows the apprentice to demonstrate the KSBs through naturally occurring evidence. Simulation is not permitted during the observation
- The observation with questions must 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
- During these breaks, the clock must be stopped and then restarted to ensure that the assessment duration is not reduced
- Questioning may occur both during and after the observation. The time for questioning is included in the overall time
- Equipment and resources needed for the observation must be in good and safe working condition.

The activities should be designed to assess a broad range of the skills, knowledge and behaviours developed over the period of the apprenticeship. However as a minimum the practical assessment will need to cover the activities listed overleaf.

The activities will need to be able to provide the evidence identified in the checklist on pages 88-90.

The activities for observation have been planned by

Full Name:	Date:	

Option:

Comments:



Equipment required:	Resources required:
Tools required:	Consumables required:



The following activities **should** be observed:

Activity	Description of planned activity
Core activities	
A Plan and prepare for work activities	
B Complete risk assessment and identify control measures	
C Communicate with a stakeholder/ colleague for example, to outline work required/ completed	
D Complete task documentation	
Specialist activities on clean water or wa E conduct planned, p water/wastewater eq i. two-three different types of maintenance	 It is sufficient for the maintenance activity to be completed astewater equipment preventative or reactive specialist maintenance clean uipment, covering
tasks ii. two different types of equipment; equipment must have multiple parts/elements	
iii. use of at least three different tools and equipment, including 'test equipment'	
iv. equipment isolation	



Core					
KSBs	Coverage check list: tick to confirm the planned activities provide (the required coverage E	Activity A,B,C,D, Ei, Eii,Eiii,Eiv)			
Health, safety and environment	Follow and comply with industry health and safety and environmental working practices and regulations				
S2, S10, B4i, B5, B6, B8	Adhere to safe working practices and procedures and carry out risk assessments				
	Work effectively and safely when undertaking tasks to approved standards and safe working practices when working alone				
	Undertake and complete work in a way that contributes to sustainable development				
	Be risk aware and minimise risks to life, property and the environment when undertaking work activities				
	Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.				
Communication S7i S8	Communicate with and provide information and guidance to colleagues in line with personal role and responsibilities				
	Handover and confirm completion of engineering activities				



KSBs	Coverage check list: tick to confirm the planned activities provide the required coverage	Activity (A,B,C,D, Ei, Eii,Eiii,Eiv)
Maintenance K2, K5, S4, S6, S9ii,	Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment	
S11, S13i, B1, B2, B4i, B7i, B8	Planned, reactive, and predictive maintenance processes, practices and procedures	
	 Carry out maintenance activities on a range of waste and water systems, plant and equipment 	
	Carry out and follow planned, reactive and predictive plant and equipment maintenance procedures	
	Work to technical specifications and supporting documentation	
	 Carry out safe isolation of equipment, using permit and lock-off systems as required 	
	Maintain equipment and components as required	
	 Display a self-disciplined, self-motivated approach whilst recognising personal limitations and seeking advice from fact holders and specialists when required 	
	Accept responsibility for work of self or others	



KSBs	Coverage check list: tick to confirm the planned activities provide the required coverage	Activity (A,B,C,D, Ei, Eii,Eiii,Eiv)
	Work effectively and safely when undertaking tasks to approved standards and safe working practices when working alone	
	□ Be quality focused	
	Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.	

Electrical

KSBs		Coverage check list: tick to confirm the planned activities provide the required coverage	Activity (A,B,C,D, Ei, Eii Eiii, Eiv)
Maintenance E4 E9		Use electrical theories and principles to use test equipment for voltage, current and earth resistance testing to maintain the integrity of the electrical system	



KSBs	Coverage check list: tick to confirm the planned activities provide the required coverage	Activity (A,B,C,D, Ei, Eii Eiii, Eiv)
	 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

KSBs		Coverage check list: tick to confirm the planned activities provide the required coverage	Activity (A,B,C,D, Ei, Eii Eiii, Eiv)
Maintenance M8i M2i		Test and service mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes	
		Inspect and monitor mechanical systems and maintain mechanical equipment and components	



ICA (Instrumentation Control and Automation)

KSBs	Co the	overage check list: tick to confirm the planned activities provide a required coverage	Activity (A,B,C,D, Ei, Eii Eiii, Eiv)
Maintenance I2i I4i I7 I8i I11		Test, calibrate and validate fixed and portable analogue and digital instrumentation using approved procedures and standards	
		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	
		Test, calibrate and validate fixed and portable analogue and digital instrumentation using approved procedures and standards	
		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	
		Carry out isolation procedures to ensure process or system stability and personnel safety when carrying out operations	



Appendix F: Practice Observation with Questions Template

Full Name of Apprentice	
Employer	
Location of End-point Assessment Full Name of Independent	
Assessor	
Date of End-point Assessment	
Start Time	
End Time	
Independent assessor additional of	comments

Please indicate the apprentice's grade for each theme and the provisional overall grade:

Core	Core	Core	Electrical	Overall grade*
Health and Safety	Communications	Maintenance	Maintenance	

*A grading table, for reference, is provided overleaf

By signing below, I confirm that the information provided is correct and the preliminary grade awarded is a true reflection of the performance by the apprentice.

Assessor Full Name and Signature:	Date:	
		Click or tap to enter a date.

In the case of a counter signature required

Assessor Full Name and Signature:	Date:
	Click or tap to enter a date.



Practical Observation Grading Table

	Outcome grade			
Core	Core	Core	Electrical/Mec	
Health and	Communicati	Maintenance*	hanical/ICA	
Safety*	ons**	*	Maintenance*	
Pass	Pass	Pass	Pass	Pass
Pass	Pass	Distinction	Pass	Pass
Pass	Distinction	Pass	Pass	Pass
Pass	Distinction	Distinction	Pass	Distinction

*Pass only **Pass or distinction.

Please Note:

Apprentices who fail one or more themed KSB's will be awarded a 'fail'.

To achieve a Pass, the Apprentice must demonstrate all the pass descriptors.

To achieve a Distinction, the Apprentice must demonstrate all the pass descriptors plus all the distinction descriptors for Core Communications and Core Maintenance.



Introduction

At the start of the Practical Observation the Assessor will:

- Introduce themselves
- Confirm their role
- Provide apprentice with information on the format of the observation with questions, including the timescales they will be working to.

(The assessor can share the grading guidance with the apprentice as this appears in the assessment plan)

The apprentice will:

- Give their full name
- Their date of birth
- Their employer name
- Confirm they are prepared for the Practical Observation; and confirm they can continue with the Practical Observation.

The apprentice will be asked to show their identification to the Assessor prior to beginning the assessment



Important points to inform the apprentice

- If at any point during the observation you perform an unsafe act/task which contravenes Health and Safety, I will immediately stop the observation.
- Please do not judge anything by me taking notes and you should not infer anything positive or negative from how long the observation lasts.
- I am not allowed to give you feedback at any point. So unfortunately, I will not be able to give you any indication of your grade and whether you have passed or failed at the end.
- Ensure that your mobile is switched off or somewhere where you will not be interrupted during the observation.

Assessor Guidance

Delivery

- The observation with questions must take up to four hours. 10% is allowed for the apprentice to complete a task or respond to a question.
- When questioning during the practical observation please consider the issue of background noise when recording apprentice responses.
- You must manage invigilation of apprentice during breaks to maintain security of the assessment.
- You must ask a minimum of five questions, across the tasks.
- Ensure to ask questions during natural stops between tasks and/or after completion of work.
- Follow-up questions can be asked where clarification is required
- The time for questioning is included in the overall assessment time.
- Answers to questions, must be recorded and time lined.



Important points

Assessment: The following activities <u>must</u> 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



Core - Health, safety and environment - S2, S10, B4i, B5, B6, B8

To achieve a PASS the apprentice must demonstrate ALL the following pass descriptors for health, safety and environment*	Ρ	Comments (non–exhaustive)
Completes risk assessment to identify risks and hazards in the workplace		
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: Health, safety and environment - Pass achiev	ed?	Y / N



Questions for Core Health, safety and environment

*As only naturally occurring work is observed, those PASS criteria that the apprentice did not have the opportunity to demonstrate can be assessed using the relevant following questions.

Questions	Apprentice response
Develop some open-ended questions	



Core - Communication – S7i S8

To achieve a PASS the apprentice must demonstrate ALL the following pass descriptors for communication*	Ρ	Comments (non exhaustive)
Communicates with colleagues as required by the task; communication style is appropriate to the audience		
Provides technically correct information and guidance		
Hands over and confirms completion of engineering activities to the appropriate person		
Uses industry terminology accurately and appropriately		
Completes task documentation in full, accurately and legibly		
Core: Communication - Pass achie	ved	Y / N



To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors for communication*	D	Comments (non-exhaustive)
Takes responsibility to explain the added benefits of the task completion		
Checks understanding with contractor, supplier or colleague answering any outstanding queries accurately.		
Core: Communication - Distinction achie	eved	Y / N

Questions for Core Communications

*As only naturally occurring work is observed, those PASS criteria that the apprentice did not have the opportunity to demonstrate can be assessed using the relevant following questions.

Questions	Apprentice response
Develop some open-ended questions	



Core - Maintenance - K2, K5, S4, S6, S9ii, S11, S13i, B1, B2, B4i, B7i, B8

To achieve a PASS the apprentice must demonstrate ALL the following pass descriptors for maintenance *	Ρ	Comments (non-exhaustive)
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		
Core: Maintenance - Pass achie	eved	Y / N



Core - Maintenance - K2, K5, S4, S6, S9ii, S11, S13i, B1, B2, B4i, B7i, B8

To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors for maintenance	D	Comments (non–exhaustive)
Justifies choice and use of resources, based on balancing the impact of cost, quality, safety, security and environment impact		
Considers options and chooses 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		
Core: Maintenance - Distinction achie	ved	Y / N



Questions for Core Maintenance

*As only naturally occurring work is observed, those PASS criteria that the apprentice did not have the opportunity to demonstrate can be assessed using the relevant following questions.

Questions	Apprentice response
Develop some open-ended questions	



Electrical option – maintenance E4 & E9

To achieve a PASS the apprentice must demonstrate ALL the following pass descriptors for electrical maintenance*	Ρ	Comments (non–exhaustive)
Uses electrical theories, principles and procedures to use test equipment as part of a planned preventative and/or reactive maintenance program		
Carries out electrical procedures on industrial low voltage systems up to 1000V AC		
Operates switchgear, fuses, motor control circuits, transformers, manual & automatically controlled drives and motors to ensure they are electrically safe.		
Electrical maintenance - Pass achie	eved	Y / N

Questions for Electrical Maintenance

*As only naturally occurring work is observed, those PASS criteria that the apprentice did not have the opportunity to demonstrate can be assessed using the relevant following questions.

Questions	Apprentice response
Develop some open-ended questions	


Mechanical option – maintenance M8i M2i

To achieve a PASS the apprentice must demonstrate ALL the following pass descriptors for mechanical maintenance*	Ρ	Comments (non–exhaustive)
Test and service mechanical equipment as part of a planned preventative and/or reactive maintenance programmes		
Mechanical maintenance - Pass achieved		Y / N

Questions for Mechanical Maintenance

*As only naturally occurring work is observed, those PASS criteria that the apprentice did not have the opportunity to demonstrate can be assessed using the relevant following questions.

Questions	Apprentice response
Develop some open-ended questions	



ICA option – maintenance I2i I4i I7 I8i & I11

To achieve a PASS the apprentice must demonstrate ALL the following pass descriptors for ICA maintenance*	Р	Comments (non–exhaustive)
Tests, maintains, calibrates and validates fixed and portable analogue and digital instrumentation as part of a planned preventative maintenance and/or reactive maintenance programme.		
ICA maintenance - Pass achieved		Y / N

Questions for ICA Maintenance

*As only naturally occurring work is observed, those PASS criteria that the apprentice did not have the opportunity to demonstrate can be assessed using the relevant following questions.

Questions	Apprentice response
Develop some open-ended questions	



Appendix G: Practice Interview Template

Name of Apprentice	
Location(s) of Practice Interview	
Name of Assessor	
Date of Practice Interview	
Start Time	
End Time	
Assessor additional comments	
	Grade

Please indicate the apprentice's practice observation grade (F/P/D):

Please Note:

To achieve a PASS the apprentice must demonstrate all the pass descriptors

To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the relevant specialist distinction descriptors relating to

- installation and commission of clean/wastewater equipment
- fault finding and repair

Fail: the apprentice does not demonstrate the pass descriptors.



Introduction

At the start of the interview the person acting as the assessor will:

- Introduce themselves
- State their role
- State the date of the interview
- Request and confirm ID from the apprentice

• Provide apprentice with information on the format of the with questions, including the timescales they will be working to. The apprentice will:

- Confirm their full name
- Confirm their date of birth
- Give their employer name
- Confirm their location and that no one else is present in the room, if remote apprentice to pan camera 360°
- Confirm they are prepared for the interview; and confirm they can continue with the interview
- Confirm that the evidence within the portfolio relates to the KSB's that will be assessed during the interview.

The apprentice will be asked to show their identification to the Assessor prior to beginning the assessment



Important points to inform the apprentice.

- Please do not judge anything by the notes being taken, nor infer anything positive or negative from how long the interview lasts.
- We are not allowed to give you feedback at any point. So unfortunately, we will not be able to give you any indication of your grade and whether you have passed or failed at the end.
- Please ensure that your mobile off is switched off or somewhere where you will not be interrupted during the interview.
- Sign placed on the door of the interview room. Interview in progress 'Do not disturb'.
- This interview will be fully recorded for the purpose of audit and quality assurance.



Assessor Guidance

Delivery

Do not forget to press record!

- The interview will last 60 minutes. 10% is allowed for the apprentice to complete their last answer
- This is an Assessor led formal interview and not a professional discussion. You must be in full control. Time management is key! If the apprentice veers off track, they need to be refocused.
- You must ask a minimum of nine questions
- The purpose of the questions is to cover the following topics: make components; work allocation/supervision; professionalism; diversity and equality; CPD; ethical matters; specialist duties; specialist installation and commission; decommission; specialist fault finding and repairs
- Ask one question from each section. There is no requirement to ask ALL the questions in each section
- Answers to questions, must be recorded. Timeline each question to the recording. Only log the time for the start of each question ask
- Additional follow-up questions are allowed to seek clarification and to make a judgement against grading descriptors.
- Adapt the questions to the apprentice's circumstances following your review of their portfolio evidence
- Supply brief written notes where each criterion has been met

At the end of the interview -Thank the apprentice for their time and wish them good luck



Make components - Core

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Resp	onse		
Describes how they have used workshop machinery and equipment to create, repair and modify component and apparatus appropriately					
Develop open ended questions to help evidence the Pass descriptor for 'Make components'	Timeline reference:		Portfolio/Job reference:	Pass?	

S5

Use workshop machinery and equipment to create, repair and modify component and apparatus.

Work allocation/supervision - Core

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response
Describes how they have managed tasks, including delegation and supervision	
Describes how their contributions to a team project made a difference, whilst working to approved standards and safe working practices	
Develop open ended questions to help evidence the Pass descriptors for 'Work allocation/supervision'	Timeli Portfoli ne o/Job refere referen nce: ce: Pass?

B4ii B9

Accept, allocate and supervise technical and other tasks.

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



Professionalism - Core

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response					
Describes how they have delivered a polite, courteous and professional service to customers and members of the public						
Develop open ended questions to help evidence the Pass descriptor for 'Professionalism'	Timeline reference:		Portfolio/Job reference:		Pass?	

B3 B7ii

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

Be professional in work and in personal standards.

Diversity and equality - Core

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Resp	onse		
Describes how they have taken account of the needs and concerns of others in relation to diversity and equality					
Develop open ended questions to help evidence the Pass descriptor for 'Diversity and equality'	Timeline reference:		Portfolio/Job reference:	Pass?	

B10

Be aware of the needs and concerns of others, especially where related to diversity and equality.



Continued professional development - Core

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response				
Describes the CPD activities they have completed and explains how it enhanced their competence					
Develop open ended questions to help evidence the Pass descriptor for 'Continued professional development'	Timeline reference:		Portfolio/Job reference:	Pass?	

B11

Carry out and record CPD necessary to maintain and enhance competence.

Ethical Manner - Core

	To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentic	e Resp	oonse		
	Describes how they exercise responsibilities in an ethical manner					
7	Develop open ended questions to help evidence the Pass descriptor for 'Ethical Manner'	Timeline reference	:	Portfolio/Job reference:	Pass?	

B12

Exercise responsibilities in an ethical manner.



Specialist Duties - Electrical

	To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response	
	Describes how they have applied technical knowledge in their electrical duties: inspecting, condition monitoring and reporting; and testing servicing/maintaining and repairing electrical equipment Describes the different contexts/settings in which they have installed, maintained and tested electrical equipment		
	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		
7	Develop open ended questions to help evidence the Pass descriptors for 'Specialist Duties'	Timeline reference: Portfolio/Job reference: Pass?	

S1 S12 S14 E1 E3 E7 S12 S14

Apply technical knowledge to carry out inspections, condition monitoring and reporting.

Drive vehicles equipped with tools and materials to job sites.

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



Inspect and monitor electrical systems, and inspect, monitor, maintain and repair electrical equipment.

Access a range of sites to install, maintain, test, repair and dismantle electrical equipment.

Test, service and repair electrical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.

Drive vehicles equipped with tools and materials to job sites.

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





Specialist Duties - Mechanical

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Apprentice Response							
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									
Develop open ended questions to help evidence the Pass descriptors for 'Specialist Duties'	Timeline reference:		Portfolio/Job reference:		Pass?				

S1 S12 S14 M2ii M5 M8ii M9 M10

Apply technical knowledge to carry out inspections, condition monitoring and reporting.

Inspect and monitor mechanical systems, and inspect, monitor, dismantle and repair mechanical equipment and components.

Use mechanical knowledge and skills to install, maintain and dismantle a wide range of complex plant, machinery and components.

Repair mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.



Install and maintain mechanical components including motors, pumps and gearboxes, maintaining and replacing lubricants.

Inspect and maintain condition monitoring equipment

Drive vehicles equipped with tools and materials to job sites.

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



Specialist Duties - ICA

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response
Describes how they have applied technical knowledge in their ICA duties: inspecting, condition monitoring and reporting, testing telemetry outstation and internal system configuration, inspecting and maintaining security equipment, telecommunication devices and alarm systems, supporting day-to-day users of instrumentation and control systems	
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	
Explains how they identify and resolve data quality and calibration issues, use standards and specifications to improve information gathered by telemetry data and complete data cleansing to	



To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response					
ensure consistent and valid data is available for business and regulation purposes						
Develop open ended questions to help evidence the Pass descriptors for 'Specialist Duties'	Timeline reference:		Portfolio/Job reference:		Pass?	

S1 S12 S14 I5 I6 I9 I10 I12 I13

Apply technical knowledge to carry out inspections, condition monitoring and reporting.

Carry out telemetry outstation and internal system configuration; Use standards and specifications to improve the information gathered by telemetry data.

Identify and resolve data quality and calibration issues.; Inspect and maintain security equipment, telecommunication devices and alarm systems.

Provide support to day-to-day users of instrumentation and control systems. Complete data cleansing to ensure consistent and valid data is available for business and regulation purposes.

Drive vehicles equipped with tools and materials to job sites.

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



Specialist installation and commission of clean/waste water equipment - Electrical

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Respo	onse		
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					
Develop open ended questions to help evidence the Pass descriptor for 'Specialist installation and commission of clean/waste water equipment'	Timeline reference:		Portfolio/Job reference:	Pass?	
To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors relating to the Electrical option	Apprentice	Respo	onse		
Identifies and explains the potential issues that could arise during the work and how they mitigate against them					
Develop open ended questions to help evidence the Distinction descriptor for 'Specialist installation and commission of clean/waste water equipment'	Timeline reference:		Portfolio/Job reference:	Distinction?	

S13ii E2 E6 E8

Install replace and commission equipment and components as required

Test electrical equipment and systems and assist in installing electrical systems and equipment

Interpret electrical drawings to install, position or re-locate electrical equipment and cabling Install and connect electrical cables, switchgear, circuit breakers, motors, transformers and other associated equipment



Specialist installation and commission of clean/waste water equipment - Mechanical

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Res	ponse		
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					
Develop open ended questions to help evidence the Pass descriptors for 'Specialist installation and commission of clean/waste water equipment'	Timeline reference:		Portfolio/Job reference:	Pass?	
To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors relating to the Mechanical option	Apprentice	Res	ponse		
Identifies and explains the potential issues that could arise during the work and how they mitigate against them					
Develop open ended questions to help evidence the Distinction descriptor for 'Specialist installation and commission of clean/waste water equipment'	Timeline reference:		Portfolio/Job reference:	Distinction?	

S13ii M3 M4 M7

Install replace and commission equipment and components as required



Test mechanical equipment and systems and assist in installing mechanical systems and equipment

Basic fabrication and welding of structures and components

Interpret plans and drawings to install, position or re-locate mechanical equipment and components



Specialist installation and commission of clean/waste water equipment - ICA

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Resp	oonse		
Explains how they have installed, tested, replaced, calibrated and dismantled ICT equipment and components (controllers, probes, attachments, cabling, meters and display units)					
Develop open ended questions to help evidence the Pass descriptor for 'Specialist installation and commission of clean/waste water equipment'	Timeline reference:		Portfolio/Job reference:	Pass?	
To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors relating to the ICA option	Apprentice	Res	oonse		
Identifies and explains the potential issues that could arise during the work and how they mitigate against them					
Develop open ended questions to help evidence the Distinction descriptor for 'Specialist installation and commission of clean/waste water equipment'	Timeline reference:		Portfolio/Job reference:	Distinction?	

S13ii I3 I4ii

Install replace and commission equipment and components as required.



Test and calibrate instrumentation and control equipment and circuits and assist in installing instrumentation and control equipment.

Use Instrumentation and Control Systems knowledge and skills to install, maintain and dismantle instruments, controllers, probes, attachments, cabling, meters and display units



Specialist fault finding and repair - Electrical

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Res	ponse		
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					
Develop open ended questions to help evidence the Pass descriptors for 'Specialist fault finding and repair	Timeline reference:		Portfolio/Job reference:	Pass?	



To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors relating to the Electrical option	Apprentice Response					
Describes different fault- finding methods they have used, justifying their choices						
Develop open ended questions to help evidence the Distinction descriptor for 'Specialist fault finding and repair	Timeline reference:		Portfolio/Job reference:		Distinction?	

K4 S3 E5 E10

Locate, diagnose and rectify faults on plant and equipment.

Principles and processes that underpin the location, diagnosis and rectification of faults.

Consult design specifications to analyse and calculate electrical system parameters and rectification procedures.

Carry out basic fault diagnostics on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems.



Specialist fault finding and repair - Mechanical

- ((To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response							
[Describes how they have ocated, diagnosed and rectified faults on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems or similar								
[f	Describes different fault inding methods they have used, justifying their choices								
t r	Develop open ended questions to help evidence the Pass descriptors for Specialist fault finding and repair	Timelin referen	e ce:		Portfolio/Job reference:		Pass?		



To achieve a DISTINCTION the apprentice must demonstrate all the pass descriptors and the following distinction descriptors relating to the ICA option	Apprentice Response					
Describes different fault- finding methods they have used, justifying their choices						
Develop open ended questions to help evidence the Distinction descriptor for 'Specialist fault finding and repair	Timeline reference:		Portfolio/Job reference:		Distinction?	

K4 S3 M1 M6

Locate, diagnose and rectify faults on plant and equipment.

Principles and processes that underpin the location, diagnosis and rectification of faults.

Apply mechanical theories and principles in order to carry out diagnostic fault finding procedures.

Consult design specifications to analyse and calculate mechanical system parameters and rectification procedures.



Specialist fault finding and repair - ICA

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Арр	rentice	Resp	oonse		
Describes how they have located, diagnosed and rectified faults						
Describes how they have repaired instrumentation and control equipment and configured and calibrated 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						
Develop open ended questions to help evidence the Pass descriptors for 'Specialist fault finding and repair	Time refe	eline rence:		Portfolio/Job reference:	Pass?	

K4 S3 I1 I2ii I8ii

Locate, diagnose and rectify faults on plant and equipment.

Principles and processes that underpin the location, diagnosis and rectification of faults.

Apply theories and principles of electronics to use equipment to carry out diagnostic fault finding procedures.

Repair and overhaul instrumentation and control equipment.

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.



Health and Safety - Core

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice	Resp	onse		
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					
Develop open ended questions to help evidence the Pass descriptors for 'Make components'	Timeline reference:		Portfolio/Job reference:	Pass?	

B4ii

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



Communicate

To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response					
Describes how they communicate with contractors and suppliers and provide information and guidance in line with personal role and responsibilities						
Develop open ended questions to help evidence the Pass descriptor for 'Make components'	Timeline reference:		Portfolio/Job reference:		Pass?	

S7ii

Communicate with and provide information and guidance to contractors, suppliers in line with personal role and responsibilities.



Additional follow up questions

Theme KSB	To achieve a PASS the apprentice must demonstrate all the pass descriptors	Apprentice Response		
		Timeline	Job	
			ref	
		Timeline	Job	•
			ref	
		Timeline	Job	•
			ref	





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