ENERGY & ENVIRONMENT AWARDS

Skills for a greener world

EEA Level 3 End-point Assessment for Utilities Engineering Technician
(Electrical; Mechanical; Instrumentation Control and Automation)

Supporting Documents

QAN 610/6021/5
ST0159 V1.1

Supporting Documents for

EEA Level 3 End-point Assessment for Utilities Engineering Technician

(Electrical; Mechanical; Instrumentation Control and Automation)

QAN 610/6021/5

Updates to the supporting documents

Since the first publication of Energy & Environment Awards Utilities Engineering Technician (UET) supporting documents, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v3.0	August 2025	Rebranded	All
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 end-point 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 'know-how' 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 name:	Apprentice's job title:	
Apprentice's ULN:		
Name of Employer:	Name of Training provider:	
Employer representatives present:	Training provider representatives present:	
Apprenticeship start date:	Apprenticeship on-programme end date:	
Was the apprentice aged 19 or over at the start of the programme?	Y / N	
Employer Decision for apprentices aged 19 or over only at the start of the programme**:**	We require the apprentice to attempt English and maths before taking the end-point assessment	Y / N
Gateway meeting date:		
Has the apprentice taken any part of the end-point assessment for this apprenticeship standard with any other End Point Assessment Organisation?	Y / N	
If 'Yes' please give details:		

Apprentice's details

Eligibility requirements:

Where applicable, the apprentice must confirm their achievement of the following

Note: For apprentices aged 19+, if maths and/or English have been attempted but not achieved evidence of the attempt should be submitted.

Eligibility requirement	Achieved by the apprentice? Y/N	Evidence (Scans of certificates MUST be included)
Achieved Level 2 English or higher		
Achieved Level 2 Maths or higher		

Gateway Eligibility Declaration

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

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

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

Energy & Environment Awards use only:	
Energy & Environment Awards Sign off:	
Comments/actions:	

Appendix C: Practice Tests

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.

DO NOT partially shade the answer circle
ANSWER COMPLETED INCORRECTLY

DO NOT use ticks or crosses
ANSWER COMPLETED INCORRECTLY

DO NOT use circles
ANSWER COMPLETED INCORRECTLY

DO NOT shade over more than one answer circle
ANSWER COMPLETED INCORRECTLY

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You may use this page for rough work

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

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

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

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

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

Question 6	
Which ONE of the following manual handling statements is 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 7	
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 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

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

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
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Question 12	
What type of information is provided on the coloured tag on a piece of rigging equipment?	
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b)	Safe working load
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What type of document should be fixed to a scaffold before use?	
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a)	Risk assessment
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c)	Permit to work
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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?	
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c)	Complete the task and then douse down under the shower
d)	Stop work and immediately report to the first aid room

Question 15	
A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?	
Possible Answers	
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

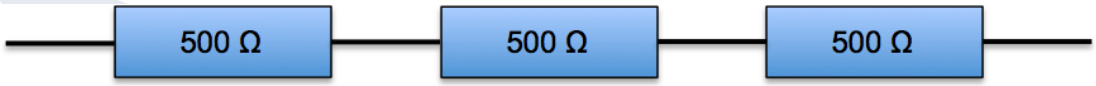
Question 17	
Which ONE of the following must be tested before entering a confined space?	
Possible Answers	
a)	Number of people wanting access
b)	Oxygen content
c)	Size of area
d)	Noise levels

Question 18	
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

Question 21	
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 is the total resistance in this circuit? 	
Possible Answers	
a)	1500 Ω
b)	500 Ω
c)	100 Ω
d)	50 Ω

[Please turn over for Question 23]

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

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

Question 26	
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 an electrical equipment label, what does the term ‘d’ refer to?	
	
Possible Answers	
a)	Type of protection
b)	Temperature group
c)	Gas group
d)	Explosion protection

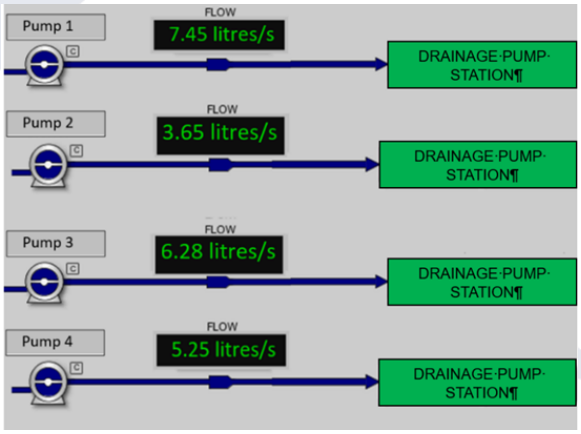
Question 28	
Which ONE of the following definitions best fits the terminology 'specification'?	
Possible Answers	
a)	The capacity to withstand continuous force
b)	The standard when measured against another object of similar design
c)	A detailed description of the design and materials of an object
d)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

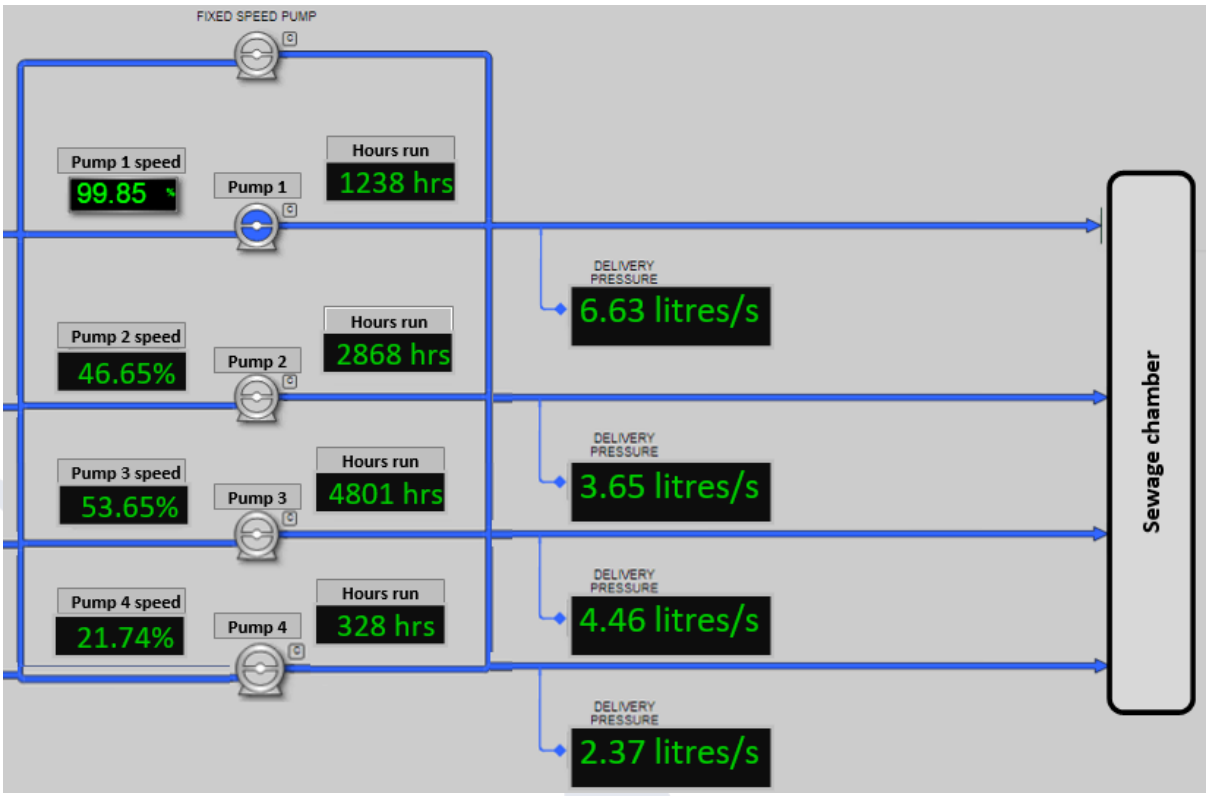
Question 29	
Which device measures a change in process conditions?	
Possible Answers	
a)	Convertor
b)	Microprocessor
c)	PLC (programmable logic controller)
d)	Sensor

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

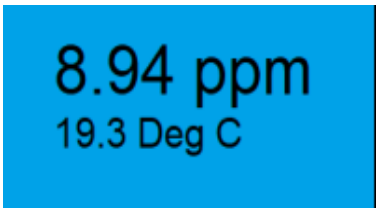
Question 31	
What type of maintenance is root cause analysis?	
Possible Answers	
a)	Preventative
b)	Reflective
c)	Planned
d)	Reactive

Question 32		
What does the symbol below represent when seen on a British Standard convention drawing?		
Possible Answers		
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

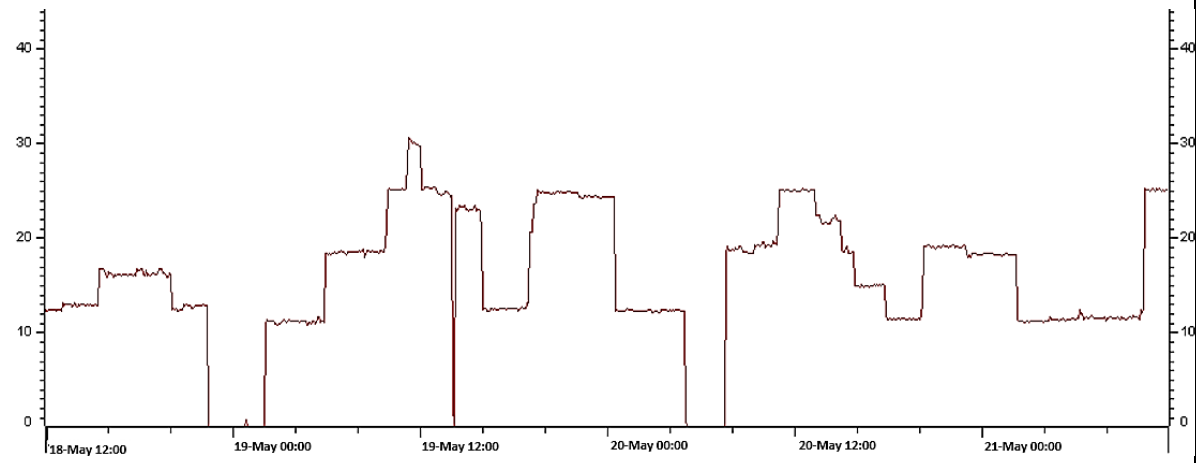
Question 34
Refer to the display below. Identify the average hours run time on the pump sets.   

Possible Answers	
a)	3196.00 hours
b)	2308.80 hours
c)	55.47 hours
d)	4.27 hours

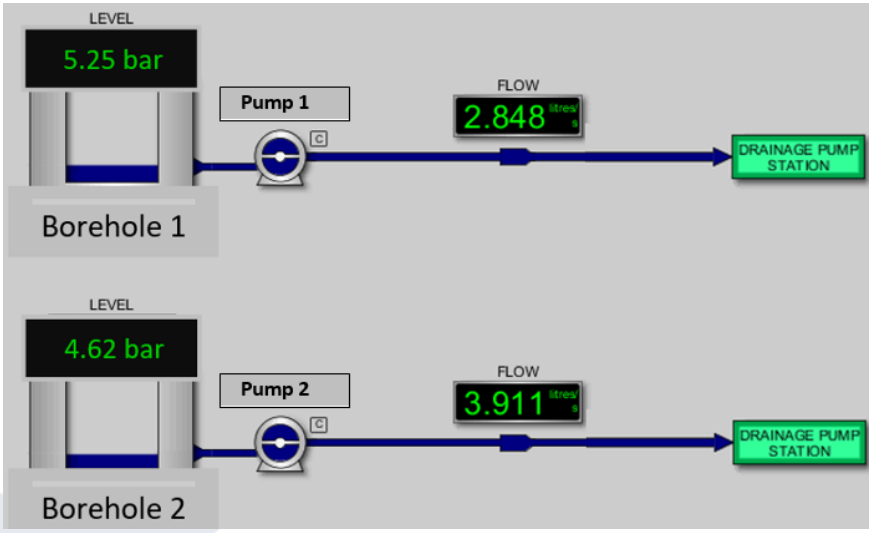
Question 35		
Refer to the image below. Which ONE of the following instruments would display this information?		
Possible Answers		
a)	Dissolved oxygen analyser	
b)	Temperature transmitter	
c)	Human Machine Interface	
d)	pH probe	

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

[Please turn over for Question 37]

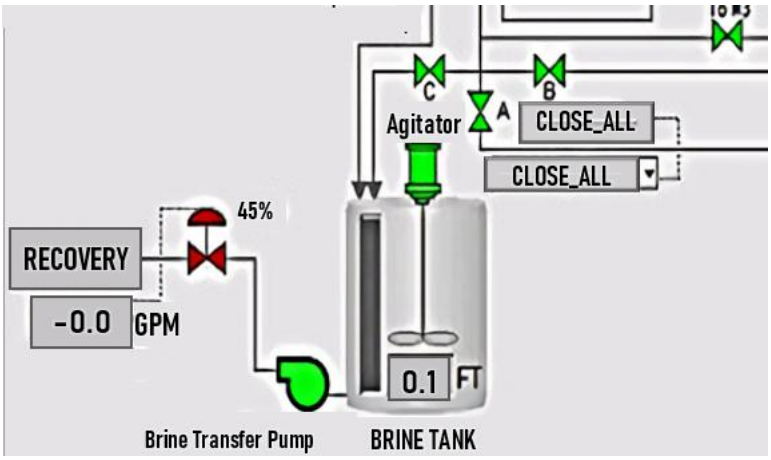
Question 37	
Refer to the trend analysis snapshot below of a pumping station. On what day did the maximum flow rate occur?  	
Possible Answers	
a)	18 May
b)	19 May
c)	20 May
d)	21 May

[Please turn over for Question 38]

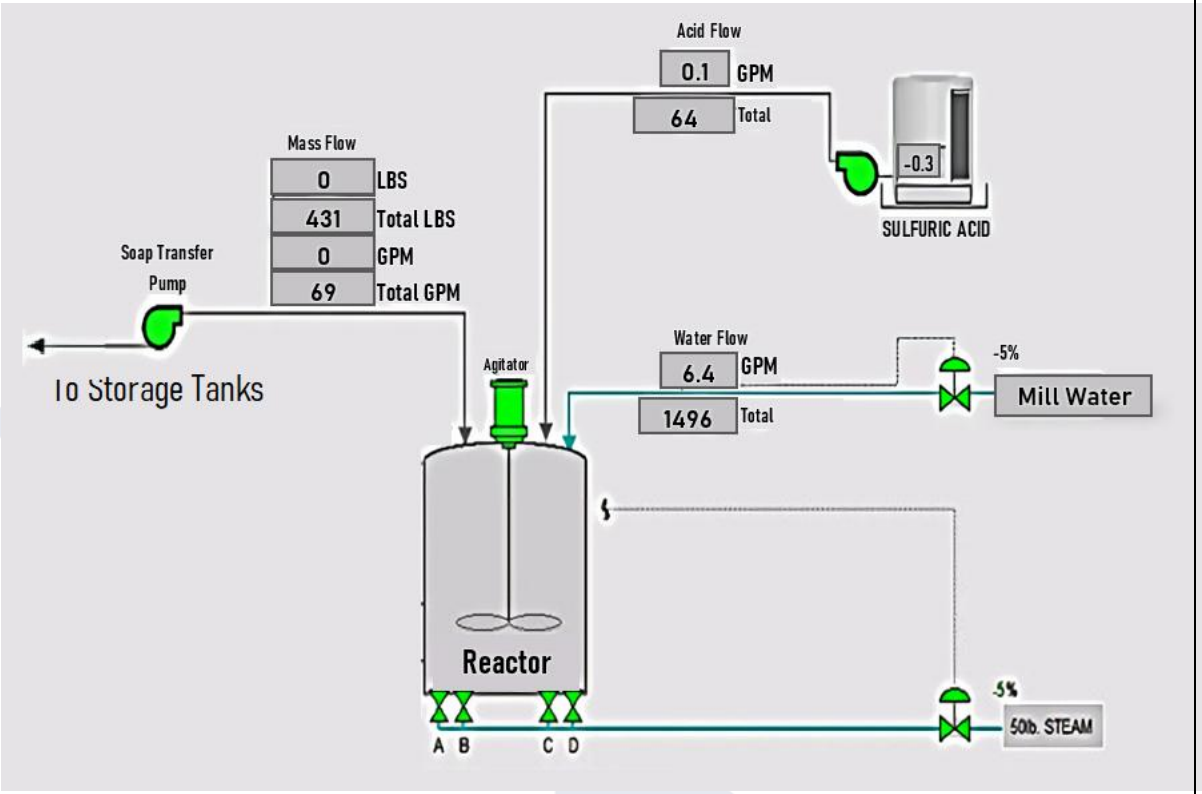
Question 38
Refer to the display below. If 1.0 bar of pressure equals approximately 10.1972 mH2O, what is the current level in mH2O of bore hole 1   

Possible Answers	
a)	29.04 mH2O
b)	39.9 mH2O
c)	47.1 mH2O
d)	53.5 mH2O

[Please turn over for Question 39]

Question 39	
Refer to the extract from a SCADA display. Which ONE of the following figures is the flowrate from the brine tank to the Recovery?  	
Possible Answers	
a)	-0.0 Gallons Per Minute
b)	The information is not in the display
c)	0.1 FT
d)	45%

[Please turn over for Question 40]

Question 40
Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor. What could prevent the water flow reaching the reactor?   

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

End of Questions

Answers

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

Level: 3

Utilities Engineering Technician

Pathway: Mechanical

Paper Code: PRACTICE PAPER

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DO NOT shade over more than one answer circle
ANSWER COMPLETED INCORRECTLY

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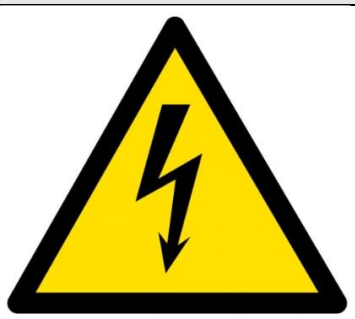
Question 1		
What type of safety sign is shown below?		
Possible Answers		
a)	Mandatory	
b)	Warning	
c)	Prohibition	
d)	Emergency	

Question 2	
State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.	
Possible Answers	
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
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Question 3	
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 4	
According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?	
Possible Answers	
a)	Elimination
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Question 5	
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

Question 6	
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 7	
Two technicians are working on the same piece of equipment which is isolated using a padlock. What safe isolation practice should be used?	
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a)	Give each technician a key to the padlock
b)	Use a multi padlock isolation tool
c)	Leave the key tied to the padlock
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Question 8	
Which ONE of the following regulations provide guidance on the use of handheld tools?	
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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)
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In accordance with Health and Safety Executive (HSE) guidelines, which ONE of the following apply isolations?	
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In accordance with Health and Safety Executive (HSE) regulations, how would you know if a substance was regarded as hazardous?	
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What type of information is provided on the coloured tag on a piece of rigging equipment?	
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b)	Safe working load
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What type of document should be fixed to a scaffold before use?	
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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?	
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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

Question 16	
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 is the correct order of working at height control measures?	
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a)	1. Fall prevention 2. personal fall protection 3. avoid work at height 4. collective fall protection
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c)	Correct manual handling should only be applied in the workplace
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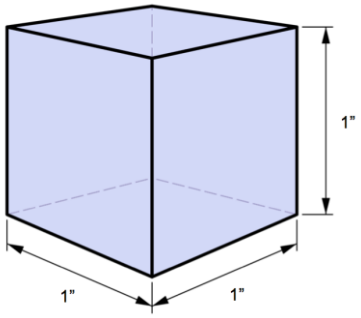
Question 21	
In terms of psi (pound/square inch), what is 1 bar is equivalent to?	
Possible Answers	
a)	1.47 psi
b)	14.7 psi
c)	17.4 psi
d)	147 psi

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

Question 23	
What is the SI (International System of Units) name for force?	
Possible Answers	
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

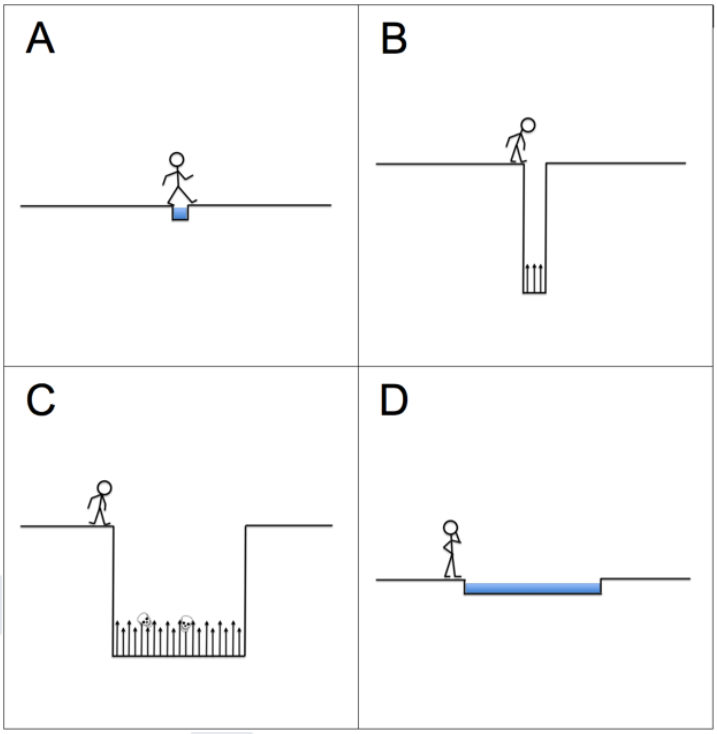
Question 25	
Which ONE of the following definitions best fits the terminology 'specification'?	
Possible Answers	
a)	The capacity to withstand continuous force
b)	The standard when measured against another object of similar design
c)	A detailed description of the design and materials of an object
d)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

Question 26		
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

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

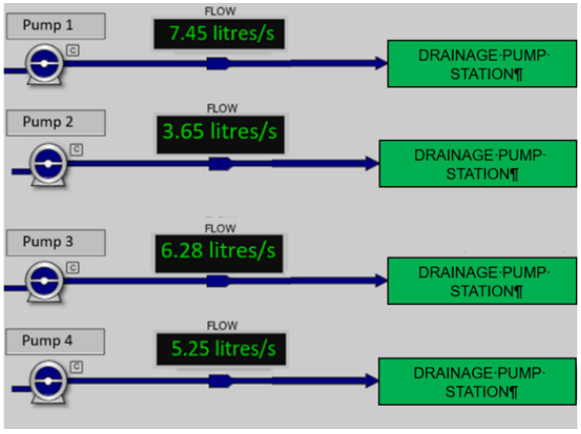


Question 30	
What would be a typical sign that a filter was starting to become blocked?	
Possible Answers	
a)	Increase in differential pressure
b)	Static differential pressure
c)	Decrease in differential pressure
d)	Zero differential pressure

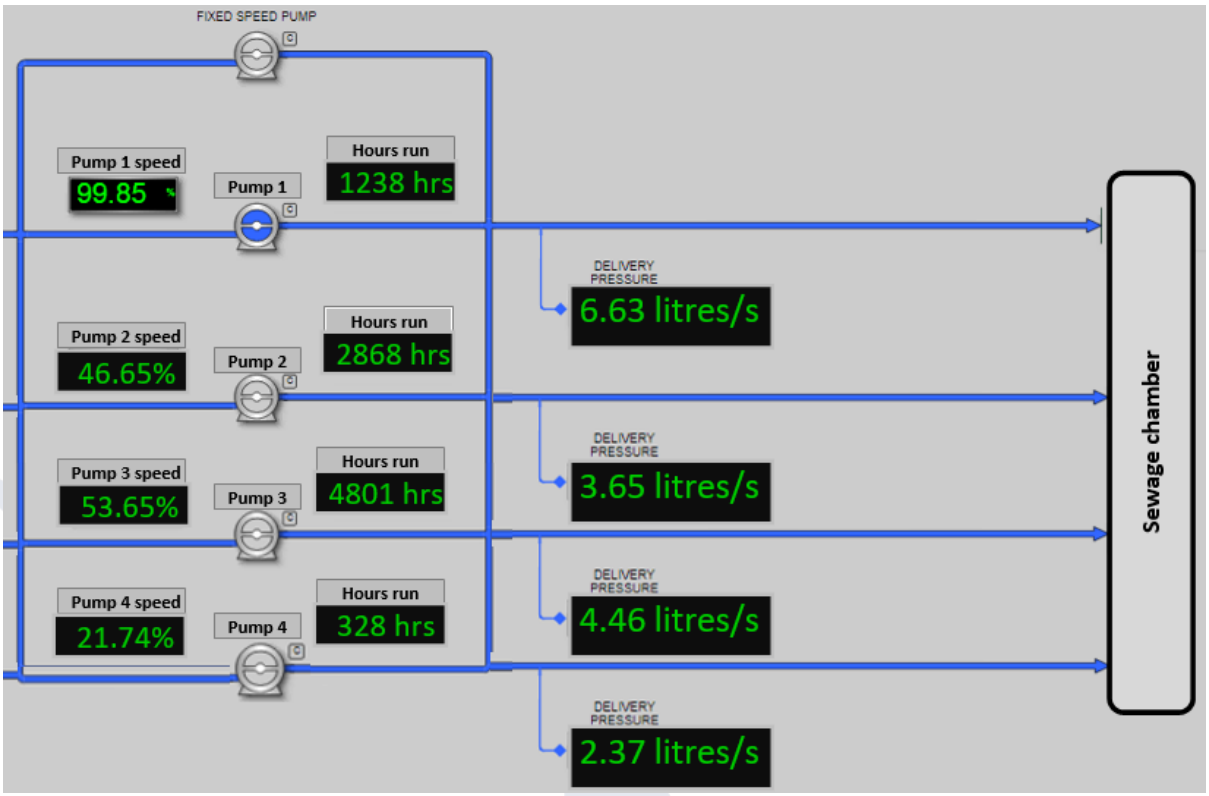
Question 31	
What is the metric SI (International System of Units) unit for torque?	
Possible Answers	
a)	Mn
b)	Nm
c)	Tq
d)	N

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

[Please turn over for Question 33]

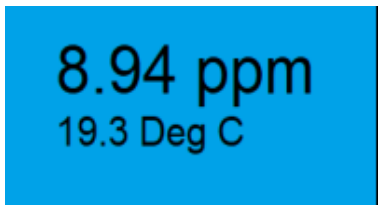
Question 33	
Refer to the diagram below. Calculate the difference between the flow rates of pump 1 and pump 4.  	
Possible Answers	
a)	2.05 litres per second
b)	2.20 litres per second
c)	2.25 litres per second
d)	3.25 litres per second

[Please turn over for Question 34]

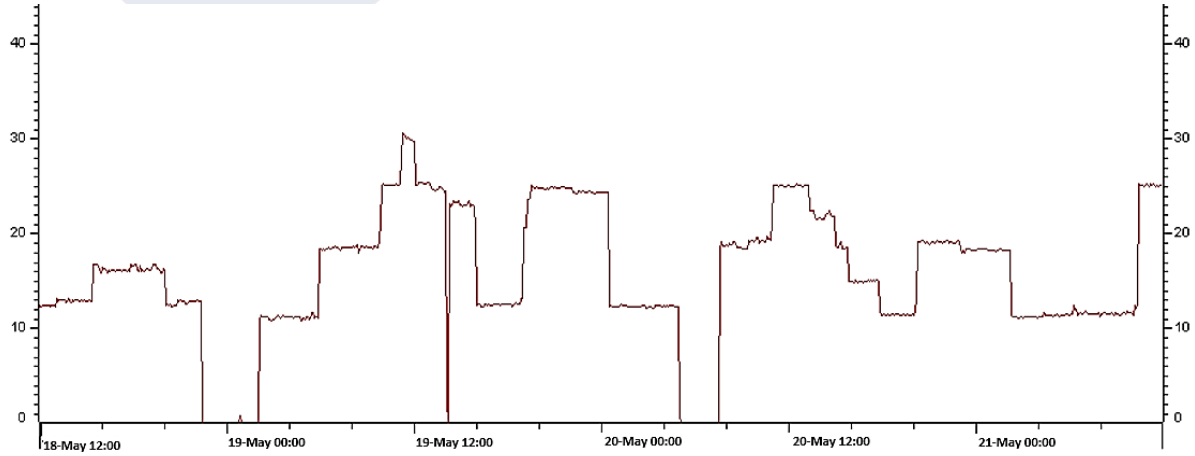
Question 34
Refer to the display below. Identify the average hours run time on the pump sets.   

Possible Answers	
a)	3196.00 hours
b)	2308.80 hours
c)	55.47 hours
d)	4.27 hours

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



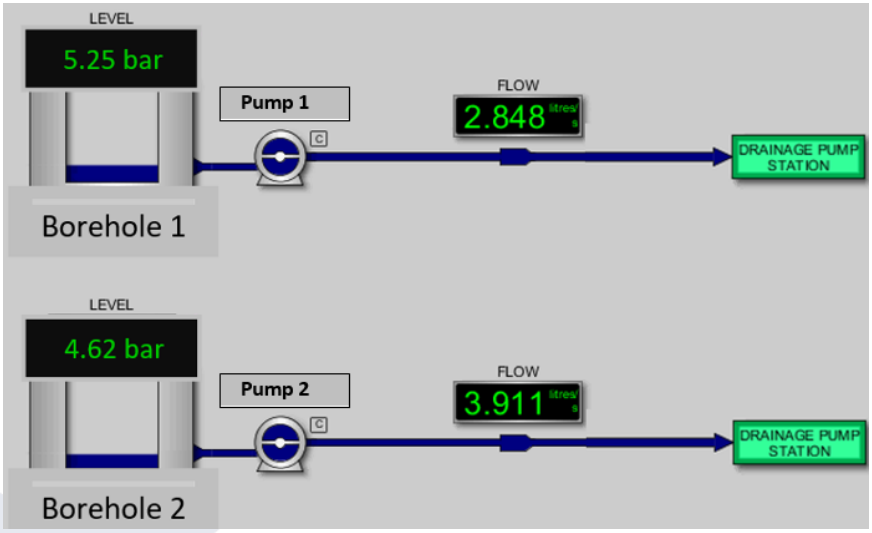
Question 36	
Refer to the trend analysis snapshot below of a pumping station. On what day did the maximum flow rate occur?	



Possible Answers	
a)	18 May
b)	19 May
c)	20 May
d)	21 May

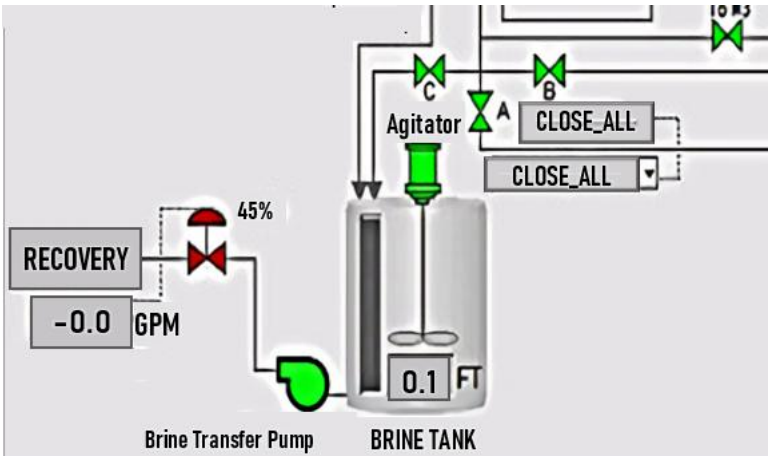
Question 37		
Refer to the image below. What measurement is the reading displaying?		
Possible Answers		
a)	Signal velocity	
b)	Viscosity of a liquid	
c)	Capacitance Probe (RF)	
d)	Turbidity	

[Please turn over for Question 38]

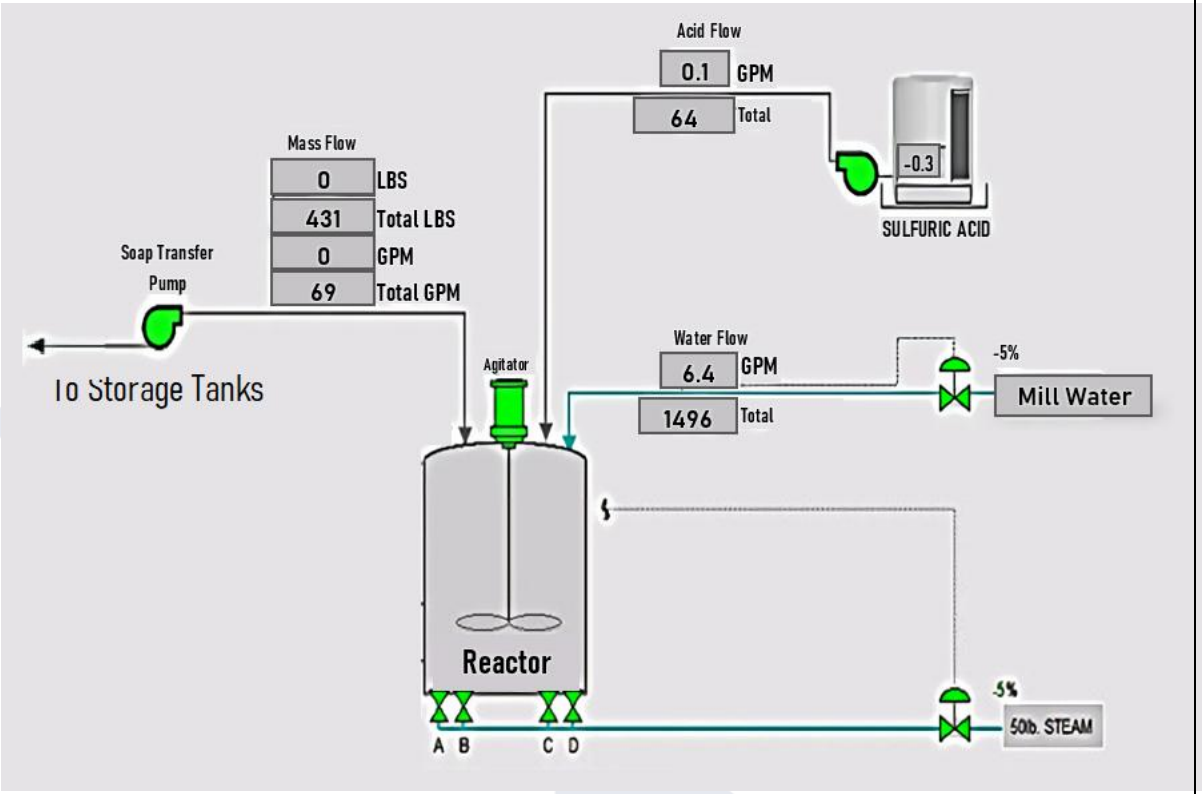
Question 38
Refer to the display below. If 1.0 bar of pressure equals approximately 10.1972 mH2O, what is the current level in mH2O of bore hole 1   

Possible Answers	
a)	29.04 mH2O
b)	39.9 mH2O
c)	47.1 mH2O
d)	53.5 mH2O

[Please turn over for Question 39]

Question 39	
Refer to the extract from a SCADA display. Which ONE of the following figures is the flowrate from the brine tank to the Recovery?  	
Possible Answers	
a)	-0.0 Gallons Per Minute
b)	The information is not in the display
c)	0.1 FT
d)	45%

[Please turn over for Question 40]

Question 40
Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor. What could prevent the water flow reaching the reactor?   

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

End of Questions

Answers

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

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.

DO NOT partially shade the answer circle
ANSWER COMPLETED INCORRECTLY

DO NOT use ticks or crosses
ANSWER COMPLETED INCORRECTLY

DO NOT use circles
ANSWER COMPLETED INCORRECTLY

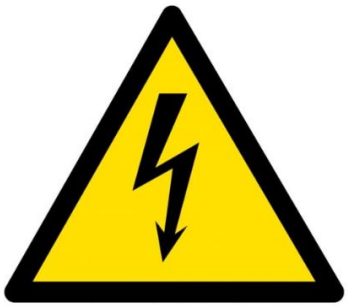
DO NOT shade over more than one answer circle
ANSWER COMPLETED INCORRECTLY

This paper must be returned to Energy & Environment Awards with the apprentice answer sheets.

You may use this page for rough work

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

Question 2	
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?		
Possible Answers		
a)	Mandatory	
b)	Warning	
c)	Prohibition	
d)	Emergency	

Question 4	
According to Health, Safety and Environment (HSE) guidelines which ONE of the following controls is the least effective?	
Possible Answers	
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 6	
State ONE purpose of completing a Control of Substances Hazardous to Health Regulations (COSHH) assessment in the workplace.	
Possible 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

Question 7	
A gas test has been completed within a confined space. Which oxygen reading would allow safe entry into the confined space?	
Possible Answers	
a)	19.5% - 23.5%
b)	14% - 19%
c)	6% - 14%
d)	< 6%

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

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

Question 10	
Which ONE of the following is commonly classed as safety-critical?	
Possible Answers	
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

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

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

Question 14	
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

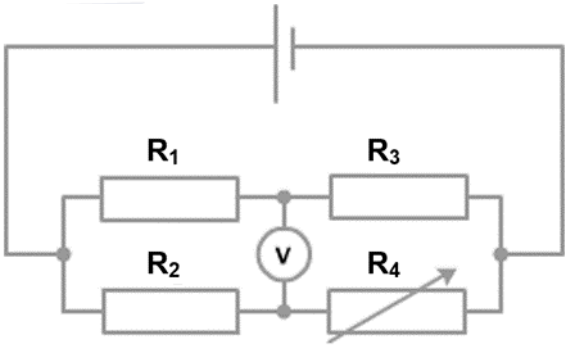
Question 17	
An operative is asked to carry out a task that will create dust. What will they need to do?	
Possible Answers	
a)	Dust is not a hazardous substance, so no safety measures are required
b)	Wait until the wind is strong so it will blow the dust away
c)	Wear the PPE identified on the permit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

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

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

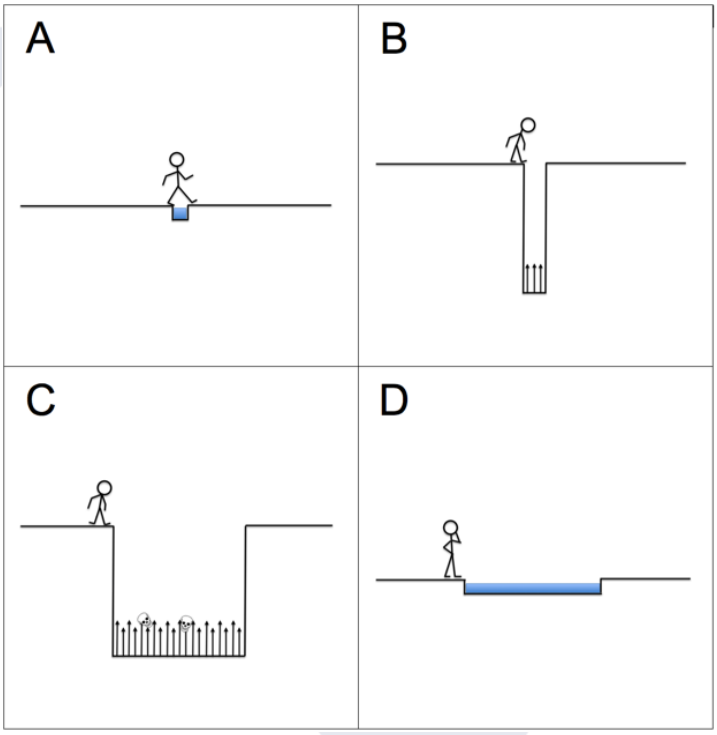
Question 20	
Assuming an emergency shower is close by, what should a technician do if they come into contact with hazardous substances whilst wearing a protective suit?	
Possible Answers	
a)	Remove all clothing and douse down under the shower
b)	Stand under the shower immediately and douse down under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

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

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

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

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



Question 25	
A technician is working on a flow transmitter with a linear feedback signal of 4-20 mA. The transmitter has a range of 0-1600 L/per min. The measured feedback signal is 14 mA. What is the flow rate?	
Possible Answers	
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

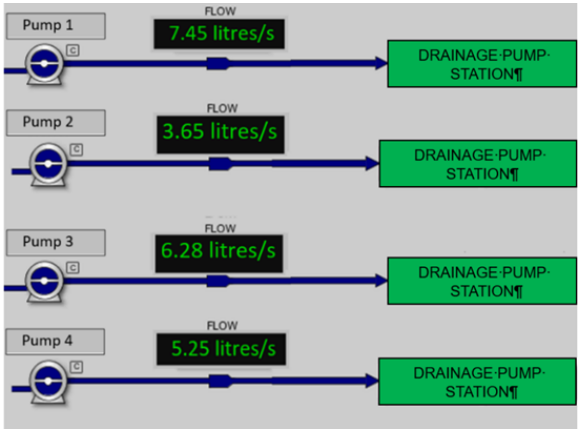
Question 28	
What is the most common output range of a pneumatic transmitter?	
Possible Answers	
a)	0 to 1.9 bar
b)	0 to 15 bar
c)	0.2 to 1.0 bar
d)	2 to 20 bar

Question 29	
In a 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

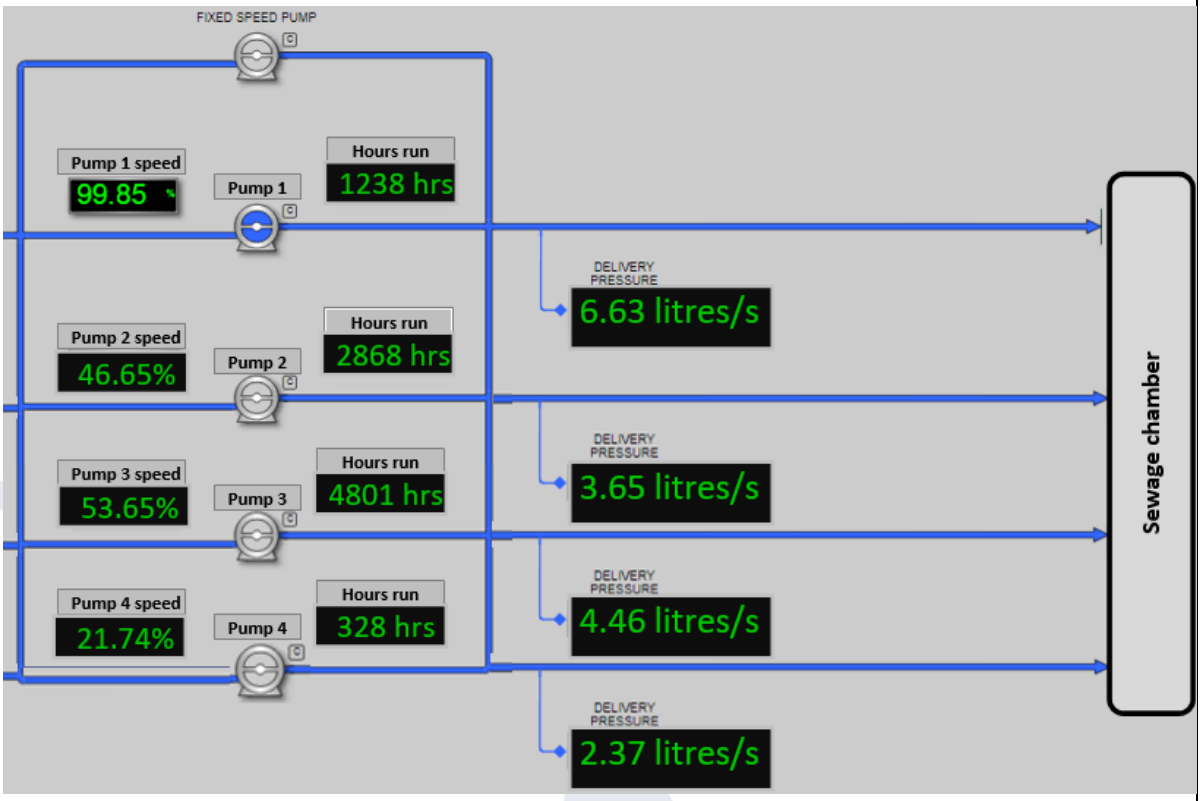
Question 30	
What is the metric SI (International System of Units) unit for torque?	
Possible Answers	
a)	Mn
b)	Nm
c)	Tq
d)	N

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

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

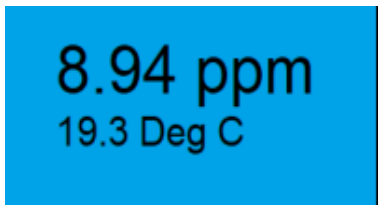
Question 33	
Refer to the diagram below. Calculate the difference between the flow rates of pump 1 and pump 4.  	
Possible Answers	
a)	2.05 litres per second
b)	2.20 litres per second
c)	2.25 litres per second
d)	3.25 litres per second

[Please turn over for Question 34]

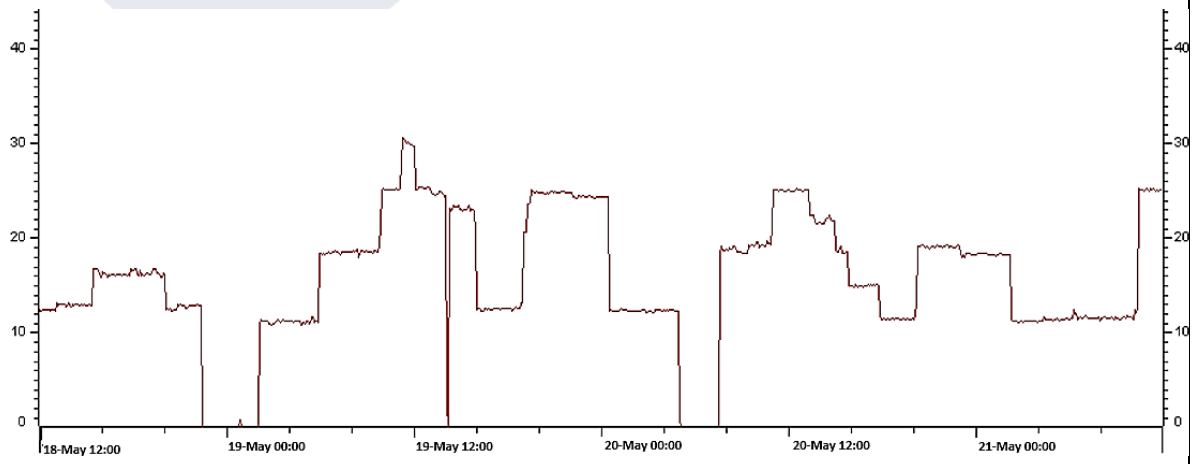
Question 34
Refer to the display below. Identify the average hours run time on the pump sets.   

Possible Answers	
a)	3196.00 hours
b)	2308.80 hours
c)	55.47 hours
d)	4.27 hours

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



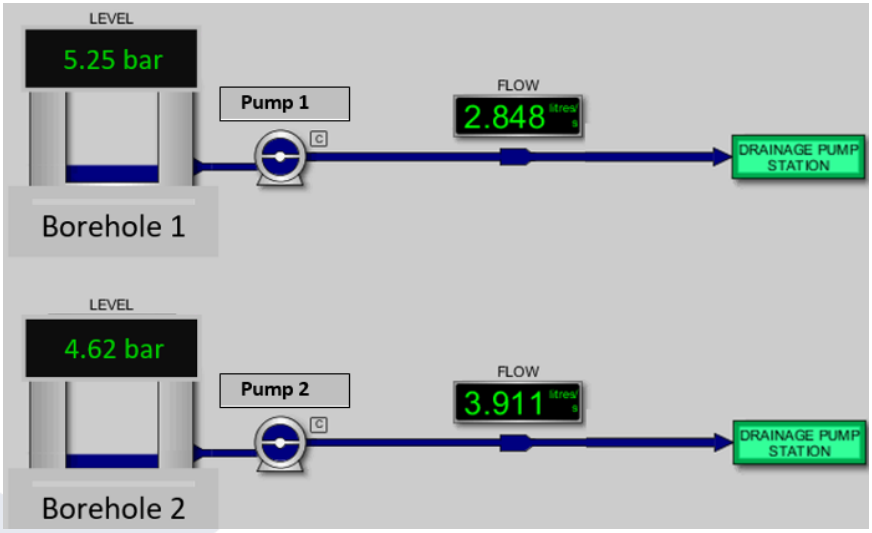
Question 36	
Refer to the trend analysis snapshot below of a pumping station. On what day did the maximum flow rate occur?	



Possible Answers	
a)	18 May
b)	19 May
c)	20 May
d)	21 May

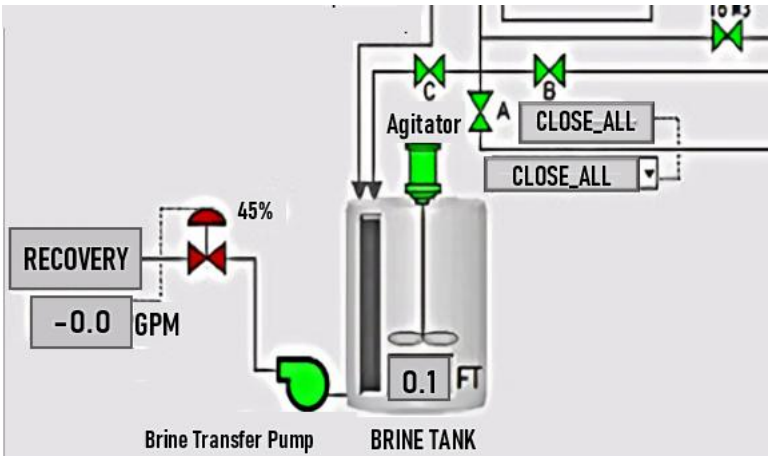
Question 37		
Refer to the image below. What measurement is the reading displaying?		
Possible Answers		
a)	Signal velocity	
b)	Viscosity of a liquid	
c)	Capacitance Probe (RF)	
d)	Turbidity	

[Please turn over for Question 38]

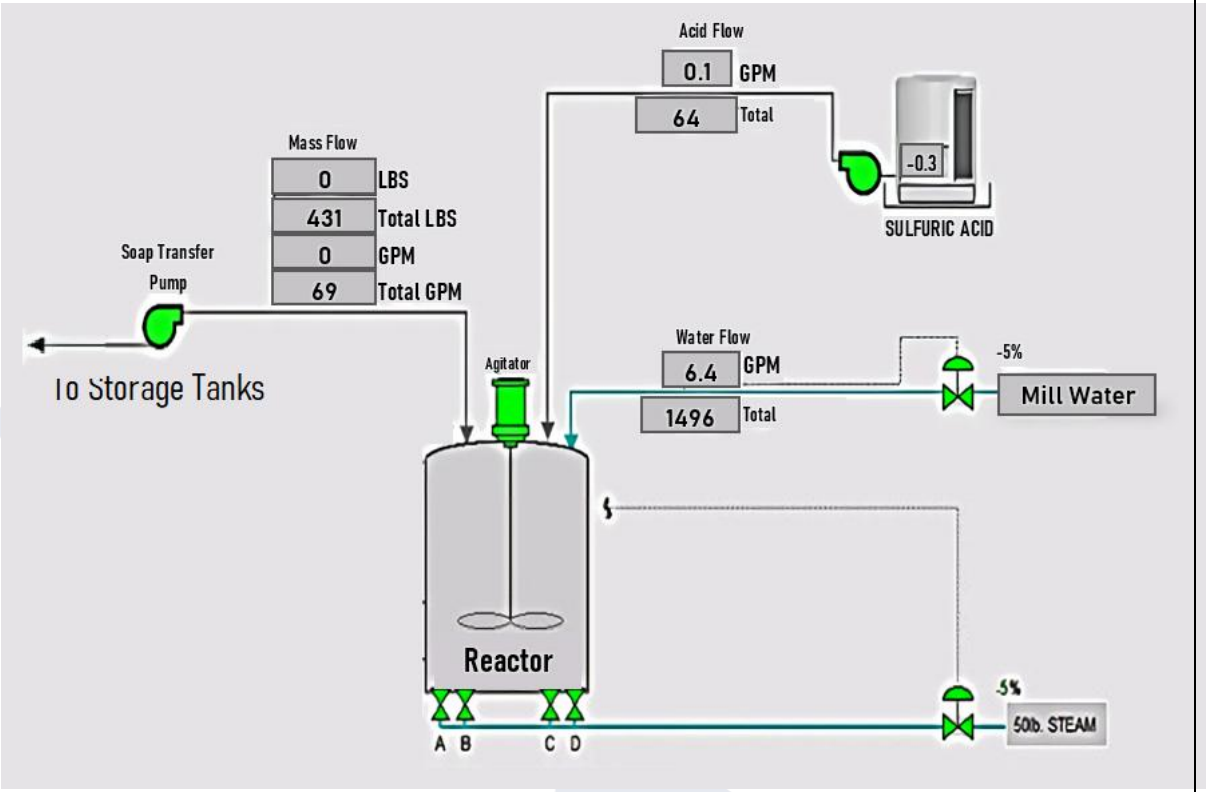
Question 38
Refer to the display below. If 1.0 bar of pressure equals approximately 10.1972 mH2O, what is the current level in mH2O of bore hole 1   

Possible Answers	
a)	29.04 mH2O
b)	39.9 mH2O
c)	47.1 mH2O
d)	53.5 mH2O

[Please turn over for Question 39]

Question 39	
Refer to the extract from a SCADA display. Which ONE of the following figures is the flowrate from the brine tank to the Recovery?  	
Possible Answers	
a)	-0.0 Gallons Per Minute
b)	The information is not in the display
c)	0.1 FT
d)	45%

[Please turn over for Question 40]

Question 40
Refer to the extract from a SCADA display. There is no flow rate being measured from the mill tank to the reactor. What could prevent the water flow reaching the reactor?   

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

End of Questions

Answers

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

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 Energy & Environment Awards 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)**		
		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**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)**		
		1	**2**	**3**
S5	Use workshop machinery and equipment to create, repair and modify component and apparatus			

GROUP 3: (Core) Communicate

Pass Criteria Describes how they communicate with contractors and suppliers and provide information and guidance in line with personal role and responsibilities				
Ref.	**Apprenticeship Standard Criteria**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)**		
		1	**2**	**3**
S7ii	Communicate with and provide information and 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 Input)**		
		1	**2**	**3**
B4ii	Accept, allocate and supervise technical and other 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**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)**		
		1	**2**	**3**
B3	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**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)**		
		1	**2**	**3**
B10	Be aware of the needs and concerns of others, 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 (Apprentice Input)**		
		1	**2**	**3**
B11	Carry out and record CPD necessary to maintain and enhance competence			

GROUP 8: (Core) Ethical manner

Pass Criteria Describes how they exercise responsibilities in an ethical manner				
Ref.	**Apprenticeship Standard Criteria**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice Input)**		
		1	**2**	**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**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice 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.			
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.			

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)		
		1	2	3
S13ii	Install replace and commission equipment and components as required			
E2				
E6				
E8				

GROUP 11: (Electrical) Electrical fault finding and repair

Pass Criteria

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

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
K4	Locate, diagnose and rectify faults on plant and equipment.			
S3	Principles and processes that underpin the location, diagnosis and rectification of faults.			
E5	Consult design specifications to analyse and calculate electrical system parameters and rectification procedures.			
E10	Carry out basic fault diagnostics on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems			

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, repairing mechanical equipment and components

Describes different types of complex plant, machinery and components they have worked on including motors, pumps and gear boxes

If appropriate to the apprentice's workplace, describes their role in driving vehicles equipped with tools and materials to job sites

If appropriate to the apprentice's workplace, describes how they provide 24 hour cover to remedy fault situations requiring diagnostic testing procedures

Ref.	Apprenticeship Standard Criteria	PORTFOLIO EVIDENCE REFERENCE (Apprentice 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.			
S14	As required, undertake standby duties to provide 24-hour cover to remedy fault situations requiring diagnostic testing procedures			
M2ii	Inspect and monitor mechanical systems, and inspect, monitor, dismantle and repair mechanical equipment and components.			
M5	Use mechanical knowledge and skills to install, maintain and dismantle a wide range of complex plant, machinery and components.			
M8ii	Repair mechanical equipment as part of planned preventative maintenance and/or reactive maintenance programmes.			
M9	Install and maintain mechanical components including motors, pumps and gearboxes, maintaining and replacing lubricants.			
M10	Inspect and maintain condition monitoring equipment			

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

Pass Criteria 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 **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**
S13ii	Install replace and commission equipment and components as required			
M3	Test mechanical equipment and systems and assist in installing mechanical systems and equipment			
M4	Basic fabrication and welding of structures and components			
M7	Interpret plans and drawings to install, position or re-locate mechanical equipment and components			

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**
K4	Locate, diagnose and rectify faults on plant and equipment.			
S3	Principles and processes that underpin the location, diagnosis and rectification of faults.			
M1	Apply mechanical theories and principles in order to carry out diagnostic fault finding procedures.			
M6	Consult design specifications to analyse and calculate mechanical system parameters and rectification procedures.			

GROUP 9: (ICA) Duties

Pass Criteria 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				
Ref.	**Apprenticeship Standard Criteria**	**PORTFOLIO EVIDENCE REFERENCE (Apprentice 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.			
S14	As required, undertake standby duties to provide 24-hour cover to remedy fault situations requiring diagnostic testing procedures.			
I5	Carry out telemetry outstation and internal system configuration.			
I6	Identify and resolve data quality and calibration issues.			
I9	Use standards and specifications to improve the information gathered by telemetry data.			
I12	Inspect and maintain security equipment, telecommunication devices and alarm systems.			
I13	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**
S13ii	Install replace and commission equipment and components as required.			
I3	Test and calibrate instrumentation and control equipment and circuits and assist in installing instrumentation and control equipment.			
I4ii	Use Instrumentation and Control Systems knowledge and skills to install, maintain and dismantle instruments, controllers, probes, attachments, cabling, meters and display units.			

GROUP 11: (ICA) ICA fault finding and repair

Pass Criteria
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
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
K4	Locate, diagnose and rectify faults on plant and equipment.			
S3	Principles and processes that underpin the location, diagnosis and rectification of faults.			
I1	Apply theories and principles of electronics to use equipment to carry out diagnostic fault finding procedures.			
I2ii	Repair and overhaul instrumentation and control equipment.			
I8iii	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.			

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 – It is sufficient for the maintenance activity to be completed on clean water or wastewater equipment E conduct planned, preventative or reactive specialist maintenance clean water/wastewater equipment, covering	
i. two-three different types of maintenance 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	Activity (A,B,C,D, Ei, Eii,Eiii,Eiv)
Health, safety and environment S2, S10, B4i, B5, B6, B8	☐ Follow and comply with industry health and safety and environmental working practices and regulations	
	☐ 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, S11, S13i, B1, B2, B4i, B7i, B8	☒ Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment	
	☐ 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	Coverage check list: tick to confirm the planned activities provide the 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 comments	

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

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

*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

KSB Theme				Outcome grade
Core Health and Safety*	**Core Communications****	**Core Maintenance*****	**Electrical/Mechanical/ICA 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 **must** be observed during the observation: ☐ Plan and prepare for work activities ☐ Complete risk assessment and identify control measures ☐ Communicate with a stakeholder/colleague for example, to outline work required/completed ☐ Complete task documentation Conduct planned, preventative or reactive specialist maintenance clean water/wastewater equipment, covering: ☐ two - three different types of maintenance tasks ☐ two different types of equipment; equipment must have multiple parts/elements ☐ use of at least three different tools and equipment, including 'test equipment' ☐ equipment isolation

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*	P	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 achieved?		**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*	P	**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 achieved		**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 achieved		**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 *	P	**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 achieved		**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 achieved		**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*	P	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 achieved		**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*	P	**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*	P	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 Response					
	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'	Timeline reference:		Portfolio/Job reference:		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 Response					
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	Apprentice Response					
	Describes how they exercise responsibilities in an ethical manner						
	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						
	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						
	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 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 Response					
	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 Response					
	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 Response					
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 Response**					
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 Response					
	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 Response					
	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 Response					
	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 located, diagnosed and rectified faults on Programmable Logic Controllers (PLC) and Supervisory Control & Data Acquisition (SCADA) systems or similar						
	Describes different fault finding methods they have used, justifying their choices						
	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 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	Apprentice Response					
	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	Timeline reference:		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 Response					
	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	