ENERGY & ENVIRONMENT AWARDS

Skills for a greener world

EEA Level 3 End-point Assessment for Engineering Maintenance Technician – Dual Discipline

Supporting Documents

QAN 610/6344/7

ST1443 V1.0

Supporting Documents for

EEA Level 3 End-point Assessment for Engineering Maintenance Technician – Dual Discipline

QAN 610/6344/7

Updates to the supporting documents

Since the first publication of the EEA Engineering Maintenance Technician – Dual Discipline (EMT) Supporting Documents, the following updates have been made.

Version	Date first published	Section updated	Page(s)
v1.0	October 2025	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

Gateway - the stage of the apprenticeship where the apprentice, employer and training provider determine whether the apprentice is ready to undertake end-point assessment

Guidance – is only provided where it is required to support interpretation of the KSB statements

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

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. Occupational standards are developed by employers for occupations that meet the Skills England current occupation criteria

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

Appendix B: Gateway Eligibility Form

(Standard ST1443 version 1.0)

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 start of programme?	Y / N
Employer Decision: We require the apprentice to attempt the Level 2 English and Mathematics before they can achieve the apprenticeship	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: 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 or ILR MUST be included)
Achieved an English qualification in line with the apprenticeship funding rules		
Achieved a mathematics qualification in line with the apprenticeship funding rules		

The apprentice must confirm the following:

Eligibility requirement	Achieved by the apprentice? Y / N	Evidence available in ACE360 Y / N
Ready to take the EPA		
Compiled and submitted an EPA portfolio that meets the specification requirements, for the interview based on an EPA portfolio		

Eligibility requirements:

The apprentice must confirm their achievement of the following:

Gateway Eligibility Declaration

1. The apprentice, the employer and the training provider must sign this form to confirm that they understand and agree to the following:
2. The apprentice has completed the required on-programme elements of the apprenticeship and is ready for end-point assessment with EEA.
3. EEA has been informed about any reasonable adjustment and/or special considerations requests.
4. The apprentice will only submit their own work as part of end-point assessment.
5. All parties agree that end-point assessment evidence may be recorded and stored by EEA for quality assurance purposes.
6. The apprentice has been on-programme for a minimum duration of 365 days.
7. Employer or training provider must confirm the apprentice is ready to take the EPA.
8. The apprentice has achieved English and mathematics qualifications in line with the apprenticeship funding rules.
9. The apprentice has compiled and submitted a competent EPA portfolio, on which the interview will be based.
10. The employer or training provider has submitted on behalf of the apprentice any policies and procedures as requested by EEA.
11. The apprentice, if successful, gives permission for EEA to request the apprenticeship. certificate from the ESFA who issue the certificate on behalf of the Secretary of State.
12. The apprentice has been directed to the EEA Appeals Policy and Complaints Policy.
13. The employer/training provider has given the EEA at least three months' notice of requesting this EPA for this apprentice.
14. If the Gateway Eligibility Report is not completed in full, meeting all requirements, and submitted to EEA, 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:
EEA use only:		
EEA Sign off:		
Comments/actions:		

Appendix C: Practice Multiple-choice Test

Level: 3

Engineering Maintenance Technician – Dual Discipline

Supporting Document: Practice Paper

Option: Electrical; control and instrumentation engineering maintenance technician

This practice paper reflects the type of questions in the live multiple-choice test, which can be taken as an online test or paper-based test.

This examination consists of 50 multiple-choice questions.

The Pass mark is 35 correct answers.

The duration of this examination is 75 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
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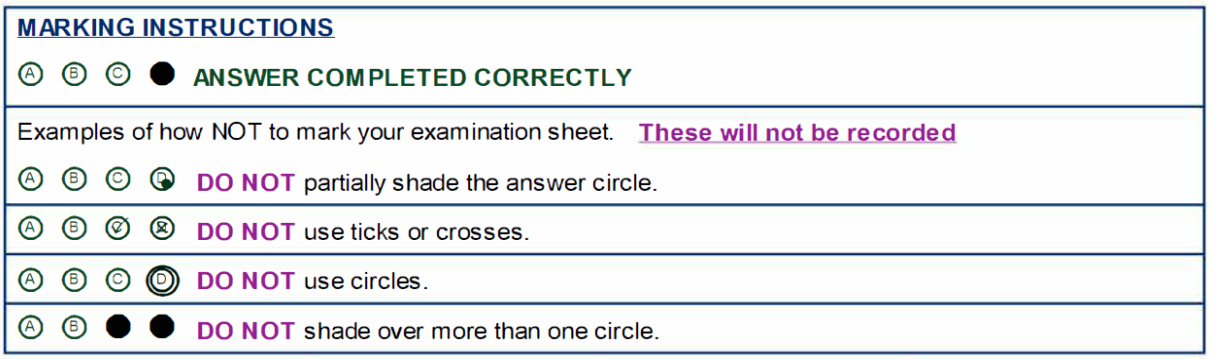

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During the early life phase of an equipment's life cycle, which maintenance strategy is most commonly applied?	
Possible answers	
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b)	Run to failure
c)	More frequent
d)	Reactive

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When selecting lubricants and fluids for equipment, what is the primary environmental consideration?	
Possible answers	
a)	Substances that can be burnt
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c)	To ensure the company's insurance remains valid
d)	To ensure normal operation, maintenance, and safety

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Total Productive Maintenance (TPM) is a maintenance approach that:	
Possible answers	
a)	is used to correct identified faults or defects
b)	is conducted after the failure of the equipment
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d)	involves employees to be proactive improving productivity

Question 5	
What is the main disadvantage of using a reactive maintenance strategy?	
Possible answers	
a)	It takes time to implement
b)	It can cause production delays
c)	Requires specialist tools and equipment
d)	Requires monitoring equipment and expertise

[Turn to the next page for question 6]

Question 6	
Run to Failure Maintenance is a maintenance strategy that:	
Possible answers	
a)	involves regular maintenance tasks scheduled in advance
b)	uses the equipment until it fails before conducting maintenance
c)	uses real time data to assess the health of the equipment during maintenance
d)	maintenance is performed at fixed intervals regardless of the condition of the equipment

Question 7	
What does Control of Substances Hazardous to Health (COSHH) symbol shown in the image represent? 	
Possible answers	
a)	Corrosive
b)	Flammable
c)	Serious health hazard
d)	Hazardous to

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Which UK regulations require businesses to take all necessary measures to prevent major accidents and limit their consequences to people and the environment?	
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What regulation places duties on employers and the self-employed to protect people from risks such as fire, explosion and corrosion of metal?	
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[Turn to the next page for question 10]

Question 10	
Which UK regulations require businesses to register with the Environment Agency and use consignment notes for the movement of dangerous materials?	
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a)	Factories Act 1961
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c)	Water Resources Act 1991
d)	Hazardous Waste Regulations 2005 (UK)

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What is the primary focus of the Environmental Protection Act 1990?	
Possible answers	
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Question 12	
According to the Waste Electrical and Electronic Equipment (WEEE) Regulations, which types of electrical and electronic equipment are covered for collection, recycling and disposal?	
Possible answers	
a)	Inoperable electrical and electronic components only
b)	Both household and business electrical and electronic equipment
c)	Electrical and electronic equipment valued above a certain threshold only
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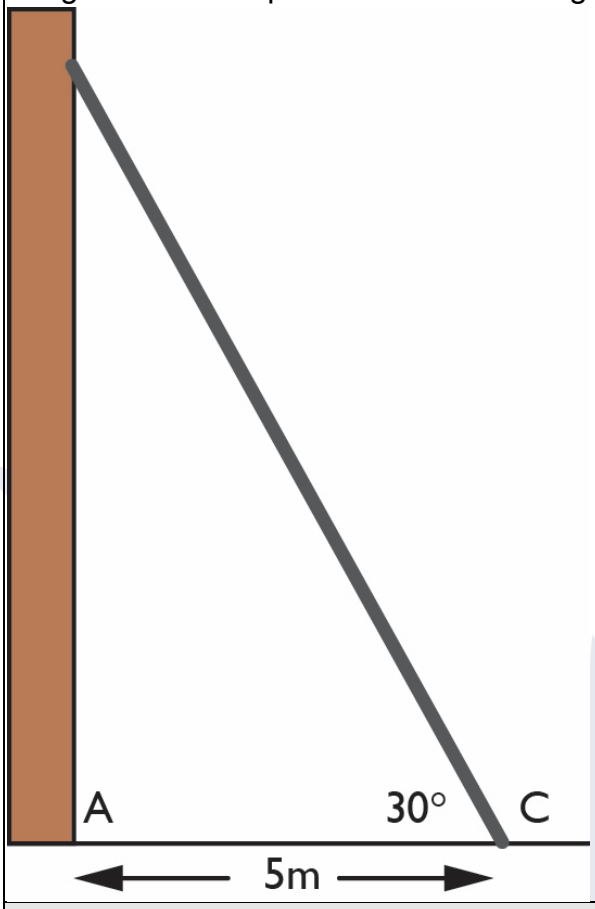
Question 13
A ladder leans against a vertical wall, forming a 30° angle with the ground. The base of the ladder is 5 metres away from the wall (horizontal distance AC). Unless otherwise stated, assume all walls are vertical and floors are horizontal. Which trigonometric function would the engineer use to calculate the vertical height from the top of the ladder to the ground to the ground (AB)? 

Possible answers	
a)	sin(θ) = Opposite / Hypotenuse
b)	cos(θ) = Adjacent / Hypotenuse
c)	tan(θ) = Opposite / Adjacent
d)	cot (θ) = Adjacent / Opposite

Question 14	
The number of alarm activations on a piece of plant was recorded every hour over a 13-hour period as follows: 2; 2; 3; 4; 4,5; 5; 6; 7; 7; 8; 9 and 10. What is the median value of these activations?	
Possible answers	
a)	5
b)	5.54
c)	6
d)	13

Question 15	
In the expression $5x^2 – 4x + 8$, what is the constant coefficient?	
Possible answers	
a)	5
b)	4
c)	8
d)	0

Question 16	
Which material is known for poor corrosion resistance and is often coated or alloyed to improve its durability?	
Possible answers	
a)	Stainless Steel
b)	Carbon Steel
c)	Titanium
d)	Copper

Question 17	
Which ONE of the following materials is known for its excellent wear resistance and is often used in manufacturing machinery components?	
Possible answers	
a)	Copper
b)	Cast Iron
c)	Hardened Steel
d)	Aluminium

Question 18	
Which material is known for its high thermal conductivity and is often used in heat exchangers?	
Possible answers	
a)	Stainless Steel
b)	Titanium
c)	Copper
d)	Lead

Question 19	
Which property is most important for materials used in forming of complex shapes through processes such as stamping?	
Possible answers	
a)	High machinability
b)	High malleability
c)	High ductility
d)	High density

Question 20	
What is the primary purpose of an engineering drawing?	
Possible answers	
a)	To provide a visual representation of an idea
b)	To serve as a legal document for patent applications
c)	To create artistic impressions of engineering concepts
d)	To communicate detailed information for a part or assembly

Question 21	
Which British Standard is commonly used in the UK for engineering drawings and technical product documentation?	
Possible answers	
a)	BS 8888:2020
b)	ISO 128:2020
c)	ISO 9001:2015
d)	DIN 476:1922

Question 22	
Which ONE of the following methods is the most efficient way to record the layout of an assembly before dismantling equipment?	
Possible answers	
a)	Search the internet to find the exact set up you are working with
b)	Try to remember how the system goes back together and hope for the best
c)	Get someone from the office to produce a detailed technical drawing of the assembly
d)	Take a photo of the assembly using a phone for reference during reassembly

Question 23	
How does data-driven decision-making improve maintenance efficiency in a manufacturing environment?	
Possible answers	
a)	It removes the need for maintenance teams, as machines will never fail
b)	It increases the number of scheduled shutdowns to inspect all machinery regularly
c)	It only uses historical maintenance data, without considering real-time sensor feedback
d)	It allows maintenance to be scheduled based on real-time equipment condition rather than fixed intervals

Question 24	
What is a primary advantage of using additive manufacturing for maintenance parts in Industry 4.0?	
Possible answers	
a)	Reduces the need for digital systems
b)	Eliminates the need for skilled labour
c)	Enables mass production of identical components
d)	Allows customisation of parts on demand

Question 25	
What is a key benefit of using Virtual Reality (VR) technology for training in a manufacturing maintenance environment?	
Possible answers	
a)	Providing real-time data analytics
b)	Reducing the cost of raw materials
c)	Creating immersive, risk-free training scenarios
d)	Increasing the physical space required for training

Question 26	
According to BS 7671:2018 IET Wiring Regulations, what is the standard test voltage for conducting an insulation resistance test on a three-phase electrical system?	
Possible answers	
a)	250V DC
b)	400V DC
c)	1000V DC
d)	500V DC

Question 27

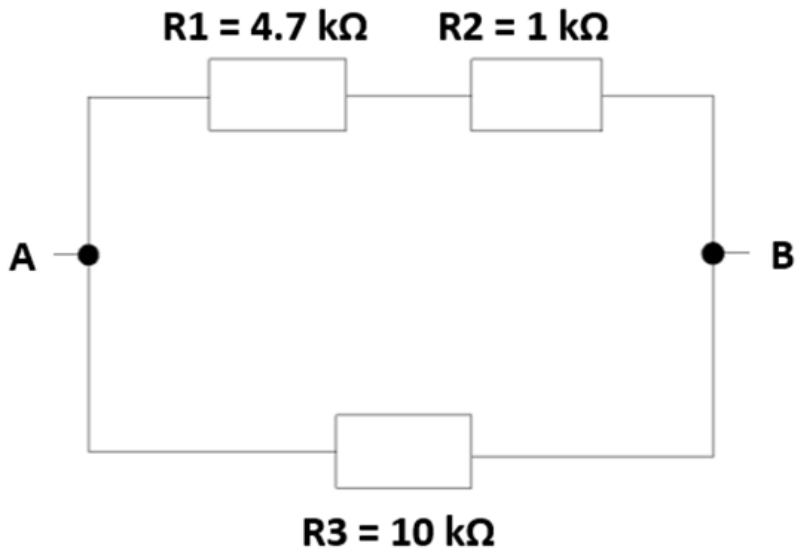
The table below shows the measurement of resistance values at a range of temperatures.

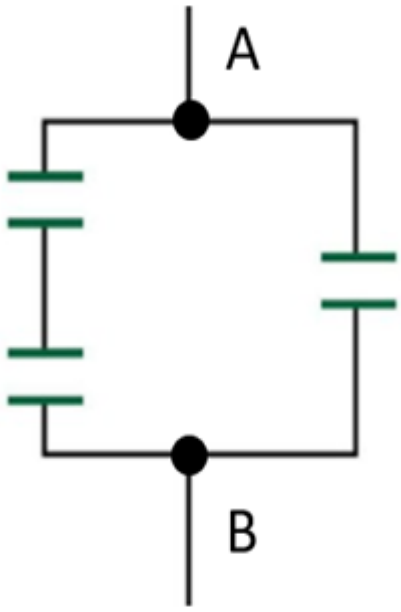
Resistance Ω	Temperature °C
200	150
208	170
216	190
224	210

What is the measurement sensitivity of the instrument?

Possible answers	
a)	0.4 Ω /°C
b)	0.9 Ω /°C
c)	2.5 Ω /°C
d)	1.06 Ω /°C

Question 28	
The phase angle on a balanced three phase electrical motor is:	
Possible answers	
a)	45°
b)	60°
c)	90°
d)	120°

Question 29	
Calculate the total resitiance of the circuit between points A and B.  	
Possible answers	
a)	3.63 Kilo-ohms
b)	15.70 Kilo-ohms
c)	1.75 Kilo-ohms
d)	4.3 Kilo-ohms

Question 30
Identify the electrical components in the circuit diagram between point A and B. 

Possible answers	
a)	Capacitors
b)	Resistors
c)	Inductors
d)	Diodes

[Turn to the next page for question 31]

Question 31	
What is the primary reason for using steel wire armoured (SWA) cable in underground installations?	
Possible answers	
a)	Ingress protection
b)	Thermal insulation
c)	Corrosion prevention
d)	Mechanical protection

Question 32	
An electrical circuit inside a Magnetic Resonance Image scanner uses a 120 ohm rated resistor which was measured 114 ohms on test. Identify the tolerance of the resistor.	
Possible answers	
a)	± 5%
b)	± 6%
c)	± 10%
d)	± 11%

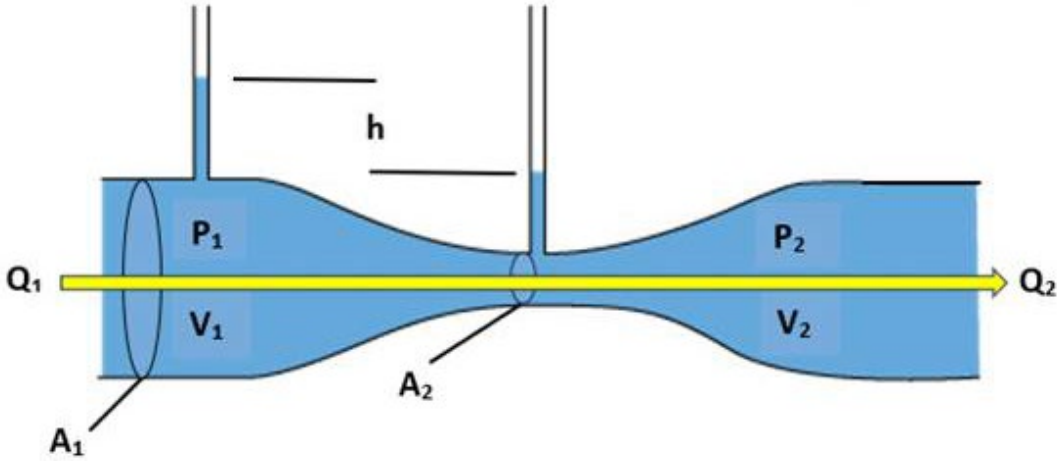
[Turn to the next page for question 33]

Question 33	
The standard electrical symbol in the below drawing represents which component? 	
Possible answers	
a)	Fuse
b)	Resistor
c)	Thermistor
d)	Circuit Breaker

Question 34	
Which ONE of the following best describes the function of an actuator?	
Possible answers	
a)	Receives energy input and converts to axial force
b)	Receives a signal and starts a system process
c)	Receives data and calculates the system error
d)	Receives an input and emits electronic signal

[Turn to the next page for question 35]

Question 35	
The primary advantage of using a screw-fit terminal connection for instrumentation wiring is that it:	
Possible answers	
a)	offers superior electrical insulation
b)	allows for rapid, tool-free disconnection
c)	provides a secure and reliable connection
d)	automatically adjusts to changes in wire gauge

Question 36	
What type of measurement device uses the principle shown below?	
	
Possible answers	
a)	Orifice Plate
b)	Venturi Tube
c)	Turbine Meter
d)	Rotameter

Question 37	
A furnace operates at a temperature of 1,100°C in a harsh environment. Which instrument is most suitable for direct contact temperature measurement?	
Possible answers	
a)	Type K Thermocouple
b)	Bimetallic Thermometer
c)	Semiconductor Thermistor
d)	Resistance Temperature Detector (RTD)

Question 38	
Which ONE of the scenarios described below is a first order system?	
Possible answers	
a)	A system which requires variables
b)	Controlling the movement of a robot arm
c)	A system requiring oscillations to be damped
d)	Adjusting the inflow rate based on the current level

Question 39	
In a control and instrumentation system, which statement best describes how a Programmable Logic Controller (PLC) processes input data?	
Possible answers	
a)	It uses analogue signals to switch outputs
b)	It converts inputs in system to digital values
c)	It only logs sensor data without controlling actuators
d)	It depends on an external computer to process sensor signals

Question 40	
Which type of diagram provides a visual and simplified representation of a system's components and interconnections?	
Possible answers	
a)	Loop Diagram
b)	Schematic Diagram
c)	Block Diagram
d)	Wiring Diagram

Question 41	
Using Ohm's Law, what is the approximate power rating (in kilowatts) of a failed heating element supplied at 230V, if its resistance was measured at 26.2 ohms during installation. Round answer to the nearest kilowatt.	
Possible answers	
a)	1.5 kW
b)	2 kW
c)	2.5 kW
d)	3 kW

Question 42	
Which ONE of the following describes the energy conversion that occurs in an electrical generator?	
Possible answers	
a)	Mechanical to electrical
b)	Electrical to mechanical
c)	Hydrodynamic to electrical
d)	Thermal to mechanical

Question 43	
Which type of technical drawing is most useful to a technician during a fault-finding exercise to understand connection details between components?	
Possible answers	
a)	Single line diagram
b)	Layout diagram
c)	Wiring diagram
d)	Block diagram

Question 44	
Which ONE of the following documents provides guidance for selecting cables in a new installation?	
Possible answers	
a)	BS 7671:2018 IET Wiring Regulations
b)	BS 7430:2015 Code of practice for earthing
c)	BS 7535:1992 Guide to the use of electrical apparatus
d)	BS 7375:2010 Distribution of electricity on construction sites

Question 45	
Which type of control system continuously monitors its output and adjusts its input based on feedback to maintain desired performance?	
Possible answers	
a)	Linear System
b)	Open Loop System
c)	Closed Loop System
d)	Continuous Time System

Question 46	
In a Supervisory Control and Data Acquisition (SCADA) system, what is the component that allows operators to monitor system performance and issue control commands to equipment?	
Possible answers	
a)	Human Machine Interface
b)	Remote Terminal Unit
c)	Visual Display Screen
d)	Digital Data Terminal

Question 47	
According to the identification letter standards defined in ISA 5:1: 2009 Instrumentation Symbols and Identification, what does the tag 'FIC' represent in an instrumentation and control system?	
Possible answers	
a)	Fire, Integrate, Close
b)	Flow, Indicate, Control
c)	Filter, Instrument, Change
d)	Fixed, Intermediate, Current

Question 48	
In an electrical circuit, if the resistance is 50 kilo-ohms (kΩ) and the capacitance is 5 microfarads (μF), what is the time constant of the circuit?	
Possible answers	
a)	0.1 seconds
b)	0.15 seconds
c)	0.20 seconds
d)	0.25 seconds

Question 49	
When carrying out Portable Appliance Testing (PAT) on a Class II electrical appliance, how many layers od insultation are required to ensure user protection?	
Possible answers	
a)	One
b)	Two
c)	Three
d)	Four

Question 50	
Where is the most suitable location to install a Resistance Temperature Detector (RTD) for accurate temperature measurement in a furnace?	
Possible answers	
a)	In the exhaust outlet
b)	Near the furnace door
c)	On the outer surface of the furnace
d)	Inside the furnace chamber, close to the heat source

End of questions

EMT – Dual Discipline

Electrical; control and instrumentation engineering maintenance technician

Practice Multiple-choice Test

Answer scheme

Question	Answer	Question	Answer	Question	Answer
1	C	21	A	41	B
2	D	22	D	42	A
3	D	23	D	43	C
4	D	24	D	44	A
5	B	25	C	45	C
6	B	26	D	46	A
7	A	27	A	47	B
8	C	28	D	48	D
9	C	29	A	49	B
10	D	30	A	50	D
11	D	31	D		
12	B	32	A		
13	C	33	A		
14	A	34	A		
15	C	35	C		
16	B	36	B		
17	C	37	A		
18	C	38	D		
19	B	39	B		
20	D	40	C		

Level: 3

Engineering Maintenance Technician – Dual Discipline

Supporting Document: Practice Paper

Option: Electrical and mechanical engineering maintenance technician

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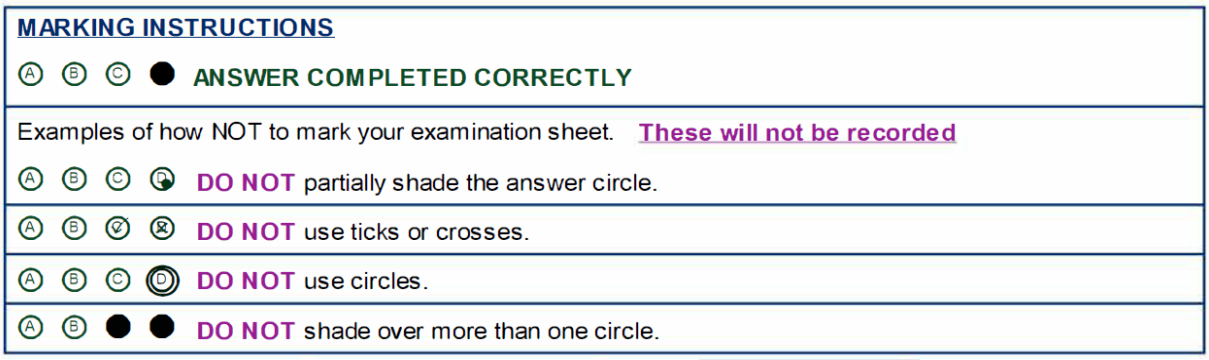

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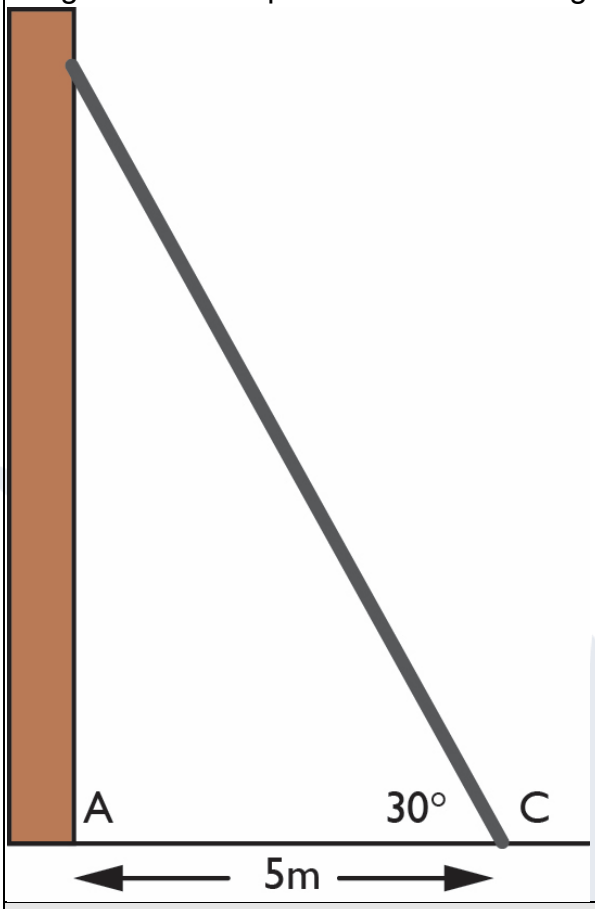
[Turn to the next page for question 13]

Question 13
A ladder leans against a vertical wall, forming a 30° angle with the ground. The base of the ladder is 5 metres away from the wall (horizontal distance AC). Unless otherwise stated, assume all walls are vertical and floors are horizontal. Which trigonometric function would the engineer use to calculate the vertical height from the top of the ladder to the ground to the ground (AB)? 

Possible answers	
a)	sin(θ) = Opposite / Hypotenuse
b)	cos(θ) = Adjacent / Hypotenuse
c)	tan(θ) = Opposite / Adjacent
d)	cot (θ) = Adjacent / Opposite

Question 14	
The number of alarm activations on a piece of plant was recorded every hour over a 13-hour period as follows: 2; 2; 3; 4; 4,5; 5; 6; 7; 7; 8; 9 and 10. What is the median value of these activations?	
Possible answers	
a)	5
b)	5.54
c)	6
d)	13

Question 15	
In the expression $5x^2 – 4x + 8$, what is the constant coefficient?	
Possible answers	
a)	5
b)	4
c)	8
d)	0

Question 16	
Which material is known for poor corrosion resistance and is often coated or alloyed to improve its durability?	
Possible answers	
a)	Stainless Steel
b)	Carbon Steel
c)	Titanium
d)	Copper

Question 17	
Which ONE of the following materials is known for its excellent wear resistance and is often used in manufacturing machinery components?	
Possible answers	
a)	Copper
b)	Cast Iron
c)	Hardened Steel
d)	Aluminium

Question 18	
Which material is known for its high thermal conductivity and is often used in heat exchangers?	
Possible answers	
a)	Stainless Steel
b)	Titanium
c)	Copper
d)	Lead

Question 19	
Which property is most important for materials used in forming of complex shapes through processes such as stamping?	
Possible answers	
a)	High machinability
b)	High malleability
c)	High ductility
d)	High density

Question 20	
What is the primary purpose of an engineering drawing?	
Possible answers	
a)	To provide a visual representation of an idea
b)	To serve as a legal document for patent applications
c)	To create artistic impressions of engineering concepts
d)	To communicate detailed information for a part or assembly

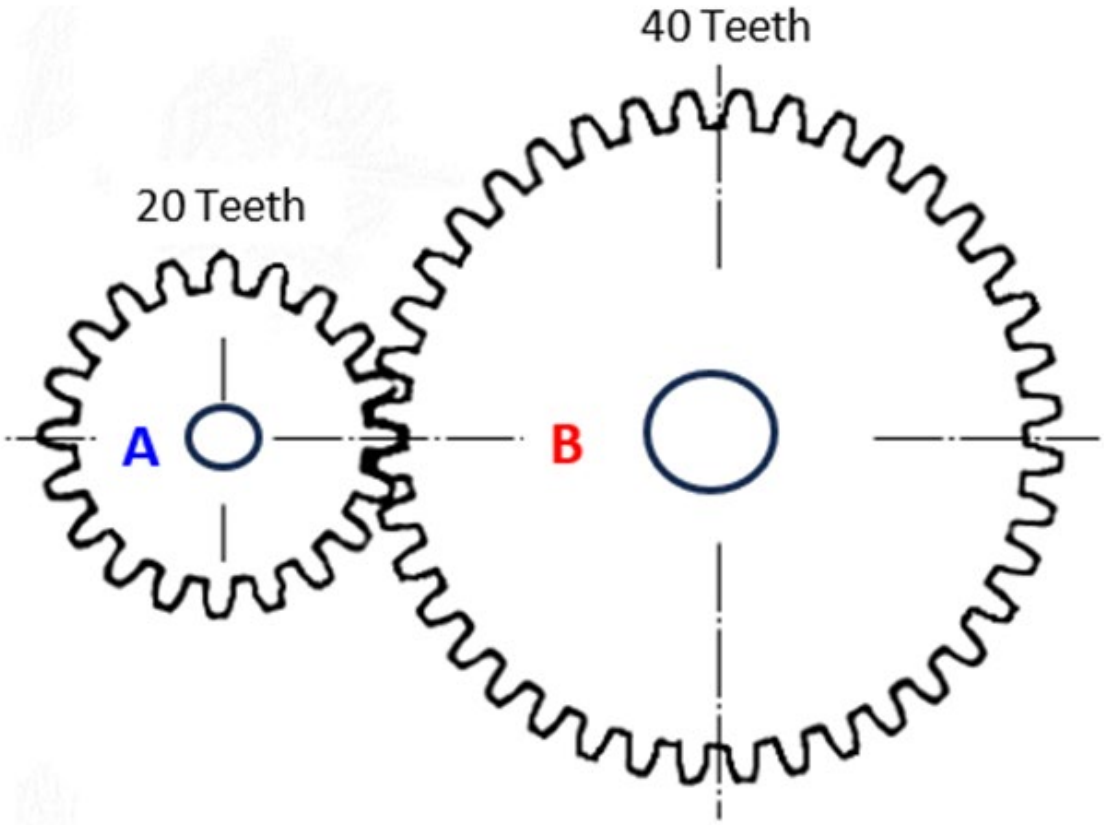
Question 21	
Which British Standard is commonly used in the UK for engineering drawings and technical product documentation?	
Possible answers	
a)	BS 8888:2020
b)	ISO 128:2020
c)	ISO 9001:2015
d)	DIN 476:1922

Question 22	
Which ONE of the following methods is the most efficient way to record the layout of an assembly before dismantling equipment?	
Possible answers	
a)	Search the internet to find the exact set up you are working with
b)	Try to remember how the system goes back together and hope for the best
c)	Get someone from the office to produce a detailed technical drawing of the assembly
d)	Take a photo of the assembly using a phone for reference during reassembly

Question 23	
How does data-driven decision-making improve maintenance efficiency in a manufacturing environment?	
Possible answers	
a)	It removes the need for maintenance teams, as machines will never fail
b)	It increases the number of scheduled shutdowns to inspect all machinery regularly
c)	It only uses historical maintenance data, without considering real-time sensor feedback
d)	It allows maintenance to be scheduled based on real-time equipment condition rather than fixed intervals

Question 24	
What is a primary advantage of using additive manufacturing for maintenance parts in Industry 4.0?	
Possible answers	
a)	Reduces the need for digital systems
b)	Eliminates the need for skilled labour
c)	Enables mass production of identical components
d)	Allows customisation of parts on demand

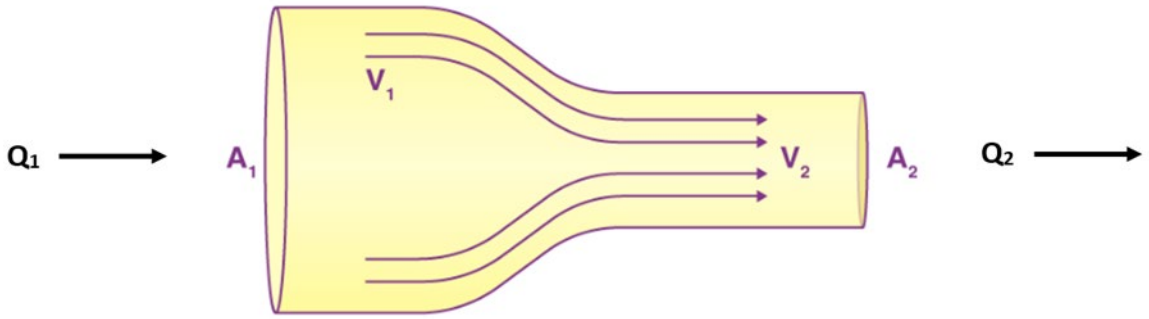
Question 25	
What is a key benefit of using Virtual Reality (VR) technology for training in a manufacturing maintenance environment?	
Possible answers	
a)	Providing real-time data analytics
b)	Reducing the cost of raw materials
c)	Creating immersive, risk-free training scenarios
d)	Increasing the physical space required for training

Question 26	
If Gear A (rotor pinion) drives Gear B (pump wheel), which ONE of the following gear ratios describes the relationship between the two gears?	
	
Possible answers	
a)	1:2
b)	1:4
c)	2:1
d)	3:1

Question 27	
According to Pascal's Lw, which ONE of the following expressions correctly calculates the output force (F2) in a hydraulic press, based on the input force (F1), input area A1) and output area (A2)?	
Possible answers	
a)	F2 = F1 ÷ (A1 × A2)
b)	F2 = F1 × (A1 ×A2)
c)	F2 = (F1 × A1) ÷ A2
d)	F2 = F1 × (A2 ÷ A1)

Question 28	
Which ONE of the following tools must be used to safely separate a person from an electrical source during electrocution?	
Possible answers	
a)	Metal ladder
b)	Steel pole
c)	Aluminium bar
d)	Plastic stick

Question 29	
Which ONE of the following describes the energy conversion that occurs in an electrical generator?	
Possible answers	
a)	Mechanical to electrical
b)	Electrical to mechanical
c)	Hydrodynamic to electrical
d)	Thermal to mechanical

Question 30
For the pipe work shown in the image, using the Continuity Equation and inputs provided, calculate velocity V_2. Round to 2 decimal places **Assume:** $Q_1 = A_1 \times V_1$ $Q_2 = A_2 \times V_2$ $A_1 \times V_1 = A_2 \times V_2$ Q_1 flow rate is 7.85×10^{-2} m^3/s A_1 area is 7.85×10^{-3} m^2 V_1 velocity is 10 m/s A_2 area is 1.963×10^{-3} m^2 

Possible answers	
a)	39.99 m/s
b)	20.55 m/s
c)	12.40 m/s
d)	4.05 m/s

Question 31	
Which ONE of the following components is commonly used to prevent stripping of threaded holes in aluminium parts?	
Possible answers	
a)	Tap and die
b)	Shoulder bolt
c)	Helicoil insert
d)	Spring washer

Question 32	
A circlip fitted into a groove within a housing bore is designed to prevent which type of movement of parts along the shaft axis?	
Possible answers	
a)	Axial
b)	Angular
c)	Diametrical
d)	Radial

Question 33	
Why do Computer-Aided Design (CAD) software packages use symbol libraries when creating standard parts such as fasteners in engineering drawings?	
Possible answers	
a)	Included in software
b)	Use supplier design
c)	Decrease data usage
d)	Improve efficiency

Question 34	
During a generator dismantling task, a risk assessment advises the technician to take precautions due to a high force spring in the bearing pre-load assembly. What type of stored energy is present in this situation?	
Possible answers	
a)	Hydraulic
b)	Electrical
c)	Mechanical
d)	Pneumatic

Question 35	
Which mechanical losses in a high-speed rotating machine can negatively affect its overall efficiency?	
Possible answers	
a)	Fatigue of rotor connections
b)	Creep of polymer components
c)	Pressure drop in oil cooler circuit
d)	Bearing windage frictional losses

Question 36	
Which ONE of the following standard abbreviations found on engineering drawings indicates the size of a hexagon bar, helping to sect the correct spanner during assembly?	
Possible answers	
a)	A / C
b)	CSK
c)	A / F
d)	PCD

Question 37	
A retaining ring located inside a housing groove provides axial restraint of components along the shaft axis in an assembly. Which ONE of the following is another design function does it can perform?	
Possible answers	
a)	Thrust loading
b)	Thermal insulation
c)	Heat transfer
d)	Radial loading

Question 38	
What are the initial consequences of installing bearings in high speed rotating equipment when there is significant misalignment between assemblies?	
Possible answers	
a)	Will result in friction and wear
b)	Will fail system efficiency target
c)	Will trip thermal overload threshold
d)	Will result in premature fatigue failure

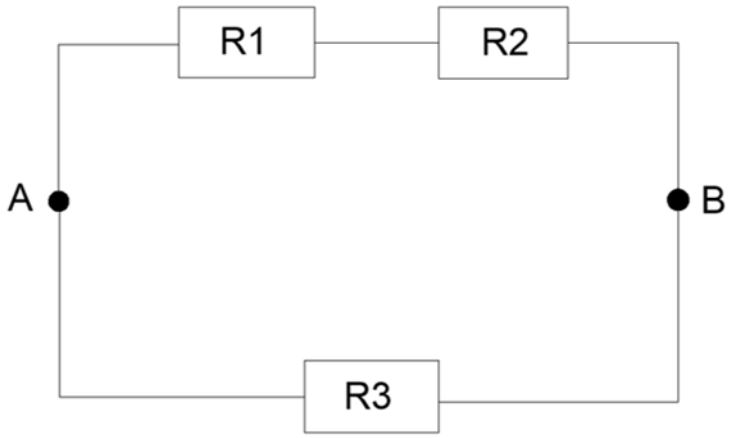
Question 39	
Neglecting atmosphere pressure, calculate the hydrostatic pressure at the bottom of an oil tank. The oil level is 4 metres high and the specific gravity of the fluid is 0.85. Assume gravitational acceleration is 9.81 m/s^2	
Possible answers	
a)	333.35 kPa
b)	33.35 kPa
c)	3.35 kPa
d)	0.35 kPa

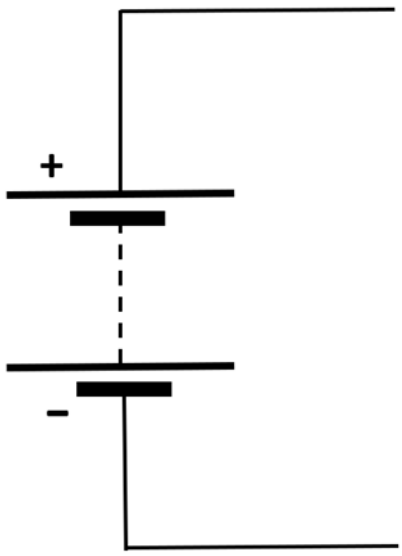
Question 40	
An oil-based hydraulic circuit supplying a series of actuators at a pressure of 207 bar. What is the equivalent pressure in pounds per square inch (PSI)? Round the answer to the nearest whole number.	
Possible answers	
a)	3002
b)	1450
c)	2175
d)	2610

Question 41	
In an engineering drawing, what does the symbol ‘N7’ typically indicate when shown at multiple surface locations?	
Possible answers	
a)	Geometrical tolerance
b)	Welding specification
c)	Surface roughness
d)	Datum feature

[Turn to the next page for question 42]

Question 42	
According to BS 7671:2018 IET Wiring Regulations, high voltage is defined as more than:	
Possible answers	
a)	240 volts AC and 400 volts DC
b)	415 volts AC and 700 volts DC
c)	1000 volts AC and 1500 volts DC
d)	1500 volts AC and 2000 volts DC

Question 43	
Identify the relationship between R1 and R2 in the circuit below: 	
Possible answers	
a)	R1 and R2 are in parallel
b)	R1 and R2 is half the sum
c)	R1 and R2 are in series
d)	R1 and R2 is the mean

Question 44	
What does the following symbol represent in the engineering drawing below?  	
Possible answers	
a)	Diode
b)	Switch
c)	Battery
d)	Ground

Question 45	
Which type of technical drawing is most useful to a technician during a fault-finding exercise to understand connection details between components?	
Possible answers	
a)	Single line diagram
b)	Layout diagram
c)	Wiring diagram
d)	Block diagram

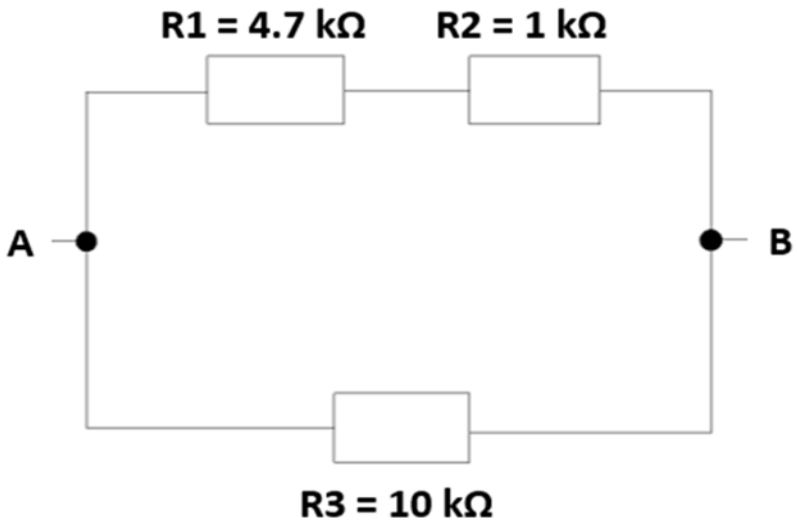
Question 46	
What is the primary reason for using steel wire armoured (SWA) cable in underground installations?	
Possible answers	
a)	Ingress protection
b)	Thermal insulation
c)	Corrosion prevention
d)	Mechanical protection

Question 47	
Which ONE of the following documents provides guidance for selecting cables in a new installation?	
Possible answers	
a)	BS 7671:2018 IET Wiring Regulations
b)	BS 7430:2015 Code of practice for earthing
c)	BS 7535:1992 Guide to the use of electrical apparatus
d)	BS 7375:2010 Distribution of electricity on construction sites

Question 48	
During the process of tightening a nut in a bolted assembly, what is the initial mechanical state of the bolt?	
Possible answers	
a)	Bolt breaches elastic limit
b)	Bolt stretches in tension
c)	Bolt plastically deforms
d)	Bolt deflects in torsion

Question 49	
When measuring the outer diameter tolerance of a bearing without applying a load, the result provides input into which ONE of the following calculations?	
Possible answers	
a)	The bearing axial play
b)	The bearing radial play
c)	The bearing to housing fit
d)	The bearing to shaft fit

[Turn to the next page for question 50]

Question 50
What is the the total resitiance of the circuit between points A and B. 

Possible answers	
a)	3.63 Kilo-ohms
b)	15.70 Kilo-ohms
c)	1.75 Kilo-ohms
d)	4.3 Kilo-ohms

End of questions

EMT – Dual Discipline – Electrical and mechanical engineering maintenance technician

Practice Multiple-choice Test

Answer scheme

Question	Answer	Question	Answer	Question	Answer
1	C	21	A	41	C
2	D	22	D	42	C
3	D	23	D	43	C
4	D	24	D	44	C
5	B	25	C	45	C
6	B	26	C	46	D
7	A	27	D	47	A
8	C	28	D	48	B
9	C	29	A	49	C
10	D	30	A	50	A
11	D	31	C		
12	B	32	A		
13	C	33	D		
14	A	34	C		
15	C	35	D		
16	B	36	C		
17	C	37	A		
18	C	38	A		
19	B	39	B		
20	D	40	A		

Appendix D - Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form

Instructions

This form has two purposes:

1. To help you plan an observation with questions for your apprentices.
2. To inform EEA of the proposed task(s) for the live assessment.

Important information

- The apprentice is assessed in their workplace in a real work setting under normal work conditions
- Simulation is not permitted during the observation
- A total of 5 hours + 30 minutes (10%) is permitted for the observation with questions
- The observation may be split into discrete sections held on the same working day
- The observation is assessed by an EEA approved independent assessor
- The ratio of assessor to apprentice is 1:1
- The employer/training provider representative must be present or immediately contactable for the duration of the assessment
- During the assessment the independent assessor will be asking questions which are part of the assessment

The activities should be designed to assess a broad range of the knowledge, skills and behaviours developed over the period of the apprenticeship. However, as a minimum the observation with questioning must cover the activities and KSBs listed in the planning and approval form below.

EEA must review the employer/training provider's observation with questions task brief.

Task variations: If you have more than one apprentice being assessed, use the 'Practical Task Variations' section of the form to indicate what the task variations that will be put in place so that apprentices are not asked to complete identical tasks.

Complete the 'Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form' and submit it to the Service

Delivery team via enquiries@energyenvironmentawards.co.uk, for **review at least 1 month before the start** of the end-point assessment. Further details can be found in the EMT-Dual Discipline EPA Specification.

Level 3 Engineering maintenance technician – dual discipline observation with questions planning and approval form

Employer name and site address	
Training provider (if applicable)	
Contact details of employer/training provider representative overseeing the setup of the observation with questions (documents, site and resources).	

Observation with Questions Checklist

Proposed Practical Task Overview

To support planning and approval of the Observation with Questions assessment, please provide a brief summary of the apprentice's proposed task. This should outline the nature of the work the apprentice will be undertaking during the 5 hour observation, including the type of planned maintenance activities and the working environment.

This checklist will assist the employer and/or training provider with planning the activity. **Please confirm all required elements are covered**:

The tasks must be set up to allow the apprentice(s) to carry out all of the following core and one of the specialist option activities, please check the boxes below to confirm:	
Core: Organising own work	☐
Core: Maintaining workplace health, safety, security, and environmental compliance	☐
Core: Using work information and following working practices	☐
Core: Completing work records	☐
Core: Communicating with others	☐
Specialist Option - Electrical and control and instrumentation engineering maintenance technician - Conducting planned electrical and control and instrumentation maintenance	☐
Specialist Option – Electrical and mechanical engineering maintenance technician - Conducting planned electrical and mechanical maintenance	☐

Brief task(s) description for discussion and review: Box will expand to allow further detail
Special requirements and site access arrangements for the assessor: Box will expand to allow further detail

The following requirements should be covered in the activity:

Organising own work	Describe where in the activity the independent assessor will observe the requirements
K4 Business operation considerations: quality, cost, delivery, and ethical practices.	
K5 Planning, prioritisation, organisation, and time management techniques.	
S2 Use planning, prioritising, organising, and time management techniques to plan tasks.	

Organising own work	Describe where in the activity the independent assessor will observe the requirements
S3 Identify and organise resources to complete tasks. For example, consumables.	

Maintaining workplace health, safety, security and environmental compliance	Describe where in the activity the independent assessor will observe the requirements
K9 Work environment hazards and risks. Risk assessments.	
K10 Safe systems of work.	
K11 Personal protective equipment (PPE): selection, use, and care.	
K12 Asset security requirements.	
K15 Recycling and waste management requirements.	
S7 Identify environmental and health and safety hazards and risks and apply control measures.	

Installation and testing	Describe where in the activity the independent assessor will observe the requirements
S8 Apply health, safety, and environmental procedures in compliance with regulations, standards, and guidance. For example, signage and barriers, working at height, confined spaces, and COSHH.	
S9 Follow security procedures. For example, site access, document classification, and securing assets.	
S12 Segregate items for reuse, recycling, and waste.	
B1 Prioritise safe working practices. For example, risk aware, minimise risks, and proactively work towards preventing accidents.	

Using work information and following working practices	Describe where in the activity the independent assessor will observe the requirements
K19 Sources of engineering information.	
K20 Engineering standards - British (BSI) and International (ISO).	
K22 Quality management systems.	
K23 Standard operating procedures (SOP): what they are and why they are important.	
K24 Foreign material exclusion requirements.	
S1 Review and use information. For example, work instructions, drawings, design specifications, and plant configurations.	
S5 Identify equipment to work on. Check plant configuration is as defined.	
S6 Prepare the work area for maintenance tasks.	
S14 Apply engineering maintenance standards and procedures.	
S15 Apply foreign material exclusion procedures.	
S16 Follow maintenance tools and equipment control procedures. For example, handling and storage.	
S17 Reinstate the work area.	
S23 Identify and highlight issues (red pen) with drawings as found.	
B3 Take ownership for the delivery and quality of own work. For example, self-motivated, disciplined in the approach to work tasks, and work carried out in line with standards.	

Completing work records	Describe where in the activity the independent assessor will observe the requirements
K25 Documentation requirements: documentation control, auditable records.	

Completing work records	Describe where in the activity the independent assessor will observe the requirements
S21 Record information	

Communicating with others	Describe where in the activity the independent assessor will observe the requirements
K29 Verbal communication methods and techniques. Engineering maintenance terminology.	
S19 Communicate with others to give and receive information. For example, colleagues, customers, and stakeholders	

Specialist option – Electrical and control and instrumentation engineering maintenance: Conducting planned electrical and control and instrumentation maintenance	Describe where in the activity the independent assessor will observe the requirements
K34 Electrical isolation and deisolation requirements: lockout tagout and testing for dead.	
K41 Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.	
K42 Electrical maintenance tools, measurement, and test equipment application, operation, and care requirements.	
K46: Isolation and deisolation of connected services considerations and requirements.	
K53: Control and instrumentation equipment and control systems maintenance requirements and	

Specialist option – Electrical and control and instrumentation engineering maintenance: Conducting planned electrical and control and instrumentation maintenance	Describe where in the activity the independent assessor will observe the requirements
methods: removing and replacing instruments and sensors, inspecting, testing, cleaning, setting up, calibration, and functional testing.	
K54: Control and instrumentation maintenance tools and equipment application, operation, care and calibration requirements.	
S27 Confirm safe electrical isolation (lockout tagout) method has been applied and test for dead.	
S28 Select, check, and use electrical maintenance tools, measurement, and test equipment.	
S31 Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.	
S32 Remove and replace electrical parts.	
S34 Set up and adjust electrical aspects of plant.	
S35 Clean parts. For example, removal of dust and debris.	
S36 Conduct and confirm electrical and connected services de-isolation	
S37 Conduct functional testing.	
S38 Inspect and test control and instrumentation systems.	
S39 Check calibration and make adjustments.	
S40 Check loop function.	

Specialist option – Electrical and control and instrumentation engineering maintenance: Conducting planned electrical and control and instrumentation maintenance	Describe where in the activity the independent assessor will observe the requirements
S41 Set up and adjust control and instrumentation systems.	
S42 Remove and replace instruments and sensors.	
S43 Re-connect instrumentation power supply, cables, pipework, and services.	
K58 Electrical isolation and deisolation requirements: lockout tagout and testing for dead.	
K65 Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.	
K66 Electrical maintenance tools, measurement, and test equipment application, operation, care and calibration requirements.	
K70 Isolation and deisolation of connected services considerations and requirements.	
K74 Mechanical maintenance requirements and techniques: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and lubricating.	
K75 Mechanical maintenance tools and equipment application, operation, care, and calibration requirements.	
S44 Confirm safe electrical isolation lockout tagout method has been applied and test for dead.	
S45 Conduct and confirm electrical and connected services isolation and deisolation.	

Specialist option – Electrical and control and instrumentation engineering maintenance: Conducting planned electrical and control and instrumentation maintenance	Describe where in the activity the independent assessor will observe the requirements
S46 Select, check, and use electrical and mechanical maintenance tools, measurement, and test equipment.	
S49 Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.	
S50 Remove and replace electrical parts.	
S52 Set up, align, and adjust electrical aspects of plant.	
S53 Clean parts. For example, removal of dust and debris.	
S54 Conduct functional testing.	
S55 Check condition and operation of mechanical aspects of plant and equipment. For example, pumps.	
S56 Remove and replace mechanical parts.	
S57 Examine mechanical parts for defects. For example, pump seals.	
S58 Set up, align, and adjust mechanical aspects of plant.	
S59 Lubricate mechanical assemblies.	

Exceptional Circumstances	
In exceptional cases where the apprentice's usual workplace cannot be accessed due to national security clearance, nuclear site restrictions or live gas safety concerns, the observation with questions can take place in a simulated. In these situations, the independent assessor must seek guidance from EEA on how to arrange access and record evidence in line with the employer's requirements. The simulated environment will be chosen by EEA and must reflect the apprentice's natural working setting. Suitable locations could include a training provider's site, a training facility within the employer's premises, a test centre or another similar environment. **Only specific skills – S32; S39; S41; S56 and S58 may be assessed in this simulated setting.** These may require minimal pre-installed elements to replicate real scenarios, and this must be agreed with Energy and Environment Awards in advance.	
Specialist option – Electrical and control and instrumentation engineering maintenance: Conducting planned electrical and control and instrumentation maintenance - **Only specific skills – S32; S39 and S41 may be assessed in this simulated setting.**	If applicable: Describe where in the activity the independent assessor will observe the requirements
S32 Remove and replace electrical parts.	
S39 Check calibration and make adjustments.	
S41 Set up and adjust control and instrumentation systems.	
Specialist option – Electrical and mechanical engineering maintenance technician: Conducting planned electrical and mechanical maintenance - **Only specific skills – S56 and S58 may be assessed in this simulated setting.**	If applicable: Describe where in the activity the independent assessor will observe the requirements
S56 Remove and replace mechanical parts.	
S58 Set up, align, and adjust mechanical aspects of plant.	

Practical Task Variations
Describe how you can vary the task(s) to ensure that the task does not become predictable. **Variation 1:** **Variation 2:** **Variation 3:**
Special requirements (for example: authorisations/access arrangements/PPE):
The observation with questioning task(s) must take 5 hours and completed on the same day.
Please state time allocated for the practical task(s): _____

Assessment Centre Setup Confirmation:
Resource Availability Confirmation: Please provide information to confirm that there is sufficient equipment tools, manuals, and other necessary resources for the apprentice to use during the assessment: ☐ _____ _____ _____ **Safety Measures Confirmation:** Please confirm that all necessary safety measures are in place to protect the apprentice during the assessment: ☐ **Equipment Functionality Confirmation:** Please provide evidence that all vehicles, equipment and tools are in good working condition and regularly maintained:☐ **Space Adequacy Confirmation:** Please confirm that there is adequate space for the apprentice to work comfortably without interference from others:☐

Assessment Centre Setup Confirmation:
Emergency Procedures Confirmation: Please confirm that emergency procedures are in place and the apprentice is aware of them: ☐ **Accessibility Confirmation:** Please confirm that the assessment area is accessible to the apprentice, including those with disabilities: ☐

IMPORTANT INFORMATION TO REMEMBER: The specific detail of the task(s) to be undertaken should be **kept confidential from the apprentices.**

Practical task: include relevant photographs to illustrate simulated task(s) for exceptional circumstances.

Exceptional Circumstances - Simulated Area Use • In exceptional cases, a simulated area may be used to assess specific skills • Only the following skills may be assessed in simulation: S32; S39; S41; S56 and S58 • You must provide clear photographs of the simulated area showing layout and equipment • These images will be reviewed by EEA before approval • Please ensure the simulated area is realistic and reflect the working environment • Include a brief explanation of why simulation is required

EEA Office use only

Date received	
Date signed off	

Appendix E: Practice Observation with Questions Template

Employers/training providers are recommended to arrange for apprentices to carry out a practice observation with questions prior to end-point assessment. The form below is for use by the person playing the part of the independent assessor.

Instructions

This should be read in conjunction with the EMT Dual Discipline Specification.

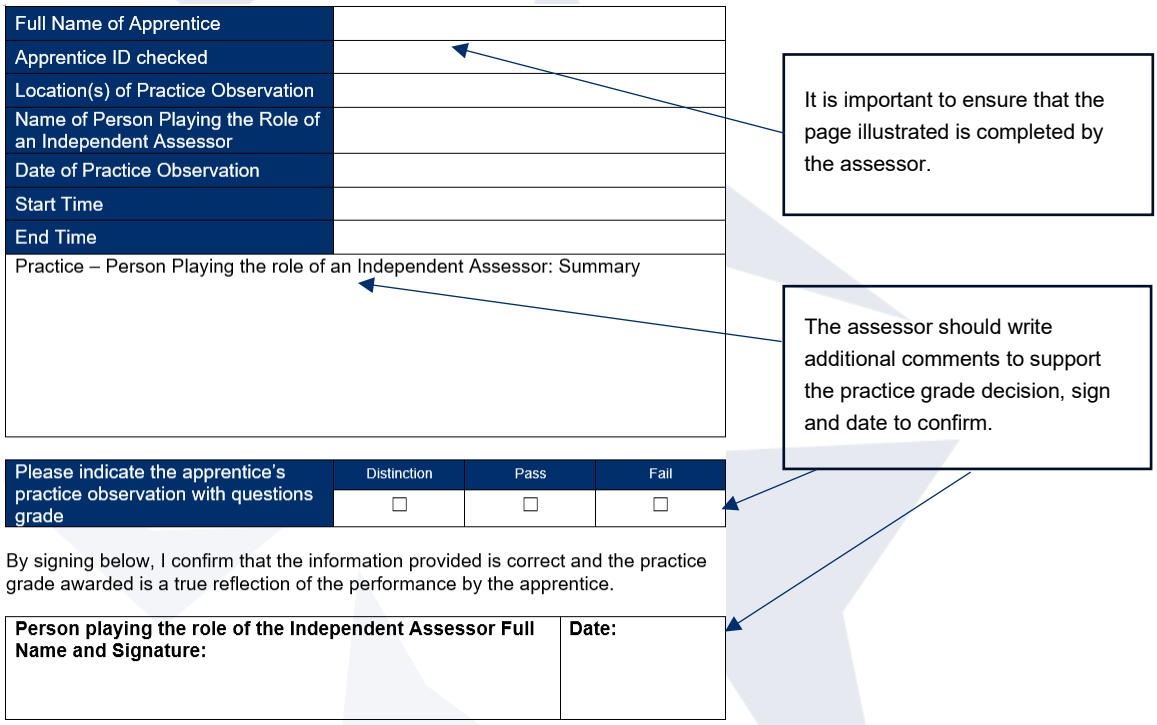
This template has been designed to help the suitable person playing part of the independent assessor and has three purposes:

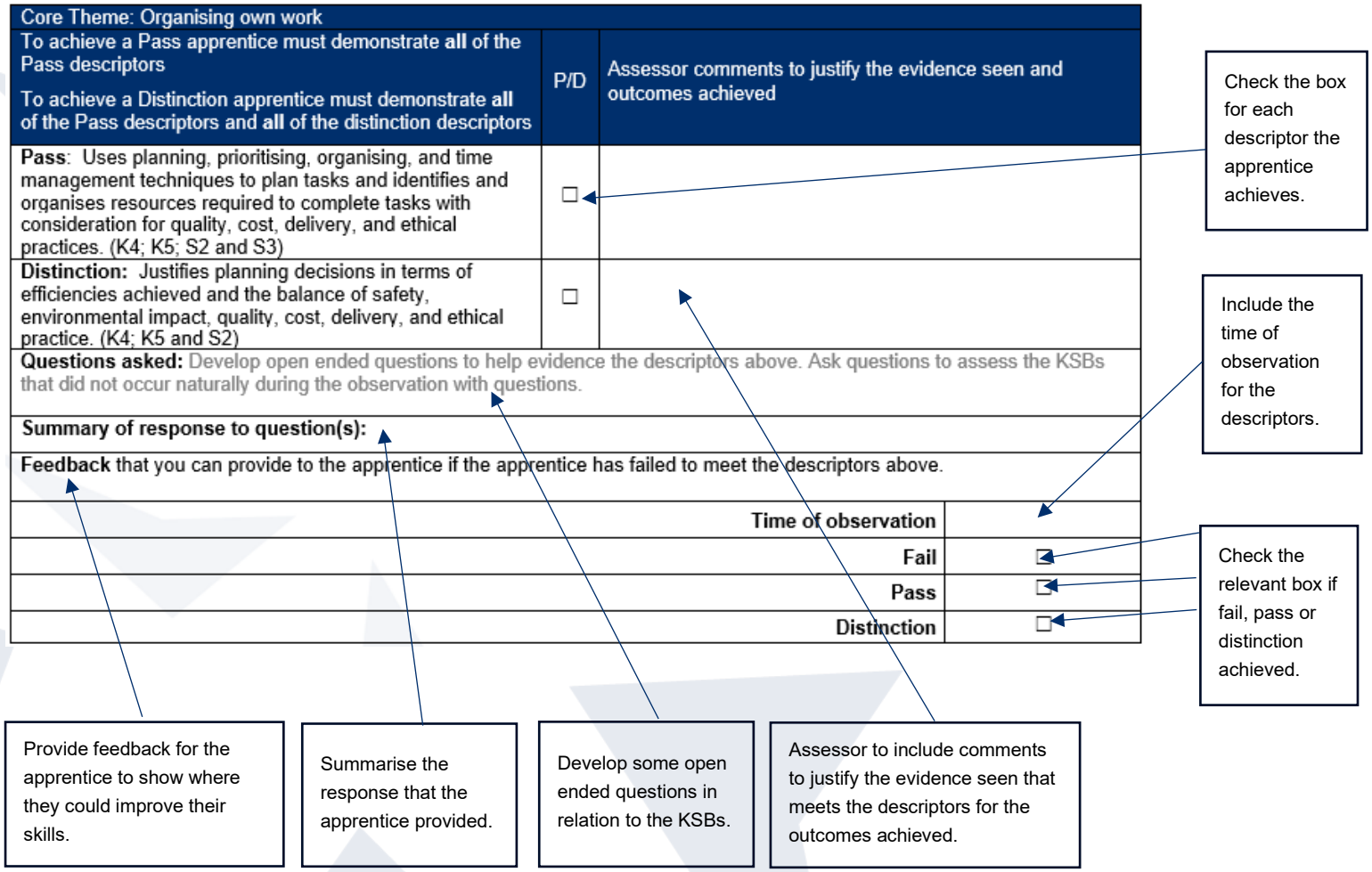
1. To prepare for a practice observation with questions
2. Designed to holistically assess a broad range of the skills, knowledge and behaviours developed over the period of the apprenticeship by the apprentice
3. To provide feedback to the apprentice in preparation for the live assessment

The assessor should:

- complete the form below which has two parts to assess the apprentice's observation with questions.

Quick Tip – How to complete the form below:





Core Theme: Organising own work		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Uses planning, prioritising, organising, and time management techniques to plan tasks and identifies and organises resources required to complete tasks with consideration for quality, cost, delivery, and ethical practices. (K4; K5; S2 and S3)	☐	
Distinction: Justifies planning decisions in terms of efficiencies achieved and the balance of safety, environmental impact, quality, cost, delivery, and ethical practice. (K4; K5 and S2)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		
Time of observation		
Fail	☐	
Pass	☐	
Distinction	☐	

Full Name of Apprentice	
Apprentice ID checked	
Location(s) of Practice Observation	
Name of Person Playing the Role of an Independent Assessor	
Date of Practice Observation	
Start Time	
End Time	
Practice – Person Playing the role of an Independent Assessor: Summary	

Please indicate the apprentice's practice observation with questions grade	Distinction	Pass	Fail
	☐	☐	☐

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

Person playing the role of the Independent Assessor Full Name and Signature:	**Date:**

Please Note:

Fail: the apprentice does not demonstrate the pass descriptors.

To achieve a Pass, the Apprentice must achieve **all** the Pass descriptors.

To achieve a Distinction an apprentice must successfully achieve **all** the Pass descriptors and **all** of the Distinction descriptors.

Assessor questions: during the live assessment, the assessor must ask at least 6 open questions.

Introduction
At the start of the observation the assessor will: • Introduce themselves • Confirm their role • State the date of the observation with questions • Provide apprentice with information on the format of the observation with questions, including the timescales they will be working to The apprentice will: • Give their full name • Give their date of birth • Give their employer's name • Confirm they are prepared for the observation with questions; and confirm they can continue with the 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. • Ensure that your mobile is turned off or placed somewhere where you will not be interrupted during the observation
Assessor Guidance
Delivery • The observation with questions   ○ must take 5 hours. The assessor may increase the time by up to 30 minutes (10%) to allow the apprentice to complete a task or respond to a question if necessary

- May be split into discrete sections held on the same working day.

- You must
  - observe apprentices on a 1:1 ratio
  - be as unobtrusive as possible
  - explain to the apprentice the format and timescales of the observation before they start
  - ask at least 6 questions. Questioning can occur both during and after the observation
  - use open-ended questions to suit individual circumstances. Follow-up questions may be asked to clarify answers given by the apprentice
  - ask questions about KSBs that were not observed to gather assessment evidence. These questions are in addition to the set number of questions for the observation and should be kept to a minimum
  - write down the question to be asked

- The following **core activities** should be observed:
  - organising own work
  - maintaining workplace health, safety, security, and environmental compliance
  - using work information and following working practices
  - completing work records
  - communicating with others

- The following **specialist activities** should be observed for **only one** of the following specialist options:
  - Specialist Option - Electrical and control and instrumentation engineering maintenance technician: Conducting planned electrical and control and instrumentation maintenance
  - Specialist Option – Electrical and mechanical engineering maintenance technician: Conducting planned electrical and mechanical maintenance

At the end of the observation with questions - Thank the apprentice for their time.

Core Theme: Organising own work		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Uses planning, prioritising, organising, and time management techniques to plan tasks and identifies and organises resources required to complete tasks with consideration for quality, cost, delivery, and ethical practices. (K4; K5; S2 and S3)	☐	
Distinction: Justifies planning decisions in terms of efficiencies achieved and the balance of safety, environmental impact, quality, cost, delivery, and ethical practice. (K4; K5 and S2)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Time of observation	
Fail	☐
Pass	☐
Distinction	☐

K4 Business operation considerations: quality, cost, delivery, and ethical practices.
K5 Planning, prioritisation, organisation, and time management techniques.
S2 Use planning, prioritising, organising, and time management techniques to plan tasks.
S3 Identify and organise resources to complete tasks. For example, consumables.

Core Theme: Maintaining workplace health, safety, security and environmental compliance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Identifies potential hazards and risks in the work environment and applies control measures in line with safe systems of work. (K9 and S7)	☐	
Pass: Priorities safe working practices by applying health, safety, and environmental procedures in compliance with regulations, standards, and guidelines including selection, use, and care of personal protective equipment. (K10; K11; S8 and B1)	☐	
Pass: Follows security procedures in line with task and company requirements. (K12 and S9)	☐	
Pass: Segregates items for reuse, recycling, and waste in line with the company's recycling and waste management requirements. (K15 and S12)	☐	
Distinction: Explains the importance of applying health, safety, and environmental procedures in their work. (K10 and S8)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		

Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.	
Time of observation	
Fail	☐
Pass	☐
Distinction	☐

K9 Work environment hazards and risks. Risk assessments.
K10 Safe systems of work.
K11 Personal protective equipment (PPE): selection, use, and care.
K12 Asset security requirements.
K15 Recycling and waste management requirements.
S7 Identify environmental and health and safety hazards and risks and apply control measures.
S8 Apply health, safety, and environmental procedures in compliance with regulations, standards, and guidance. For example, signage and barriers, working at height, confined spaces, and COSHH.
S9 Follow security procedures. For example, site access, document classification, and securing assets.
S12 Segregate items for reuse, recycling, and waste.
B1 Prioritise safe working practices. For example, risk aware, minimise risks, and proactively work towards preventing accidents.

Core Theme: Using work information and following working practices.		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Reviews and uses information including engineering information to plan and complete tasks. (K19 and S1)	☐	
Pass: Identifies equipment to work on and checks plant configuration is as defined, identifying and highlighting issues with drawings as found in line with company procedures. (S5 and S23)	☐	
Pass: Prepares the work area for maintenance in line with task requirements and company procedures. (S6)	☐	
Pass: Takes ownership for the delivery and quality of work by applying British (BSI) and International (ISO) engineering maintenance standards and procedures to support their company's quality management systems. (K20; K22; K23; S14 and B3)	☐	
Pass: Applies foreign material exclusion procedures in line with task requirements and company procedures. (K24 and S15)	☐	
Pass: Follows maintenance tools and equipment control requirements in line with company procedures. (S16)	☐	
Pass: Reinstates the work area in line with task requirements and company procedures. (S17)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		

Summary of response to question(s)	
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.	
Time of observation	
Fail	☐
Pass	☐

K19 Sources of engineering information.
K20 Quality management systems.
K23 Standard operating procedures (SOP): what they are and why they are important.
K24 Foreign material exclusion requirements.
S1 Review and use information. For example, work instructions, drawings, design specifications, and plant configurations.
S5 Identify equipment to work on. Check plant configuration is as defined.
S6 Prepare the work area for maintenance tasks.
S14 Apply engineering maintenance standards and procedures.
S15 Apply foreign material exclusion procedures.
S16 Follow maintenance tools and equipment control procedures. For example, handling and storage.
S17 Reinstate the work area.
S23 Identify and highlight issues (red pen) with drawings as found.
B3 Take ownership for the delivery and quality of own work. For example, self-motivated, disciplined in the approach to work tasks, and work carried out in line with standards.

Core Theme: Completing work records		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Records information for work tasks in line with their company's procedures for documentation control and auditable records. (K25 and S21)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		
Time of observation		
Fail		☐
Pass		☐

K25 Documentation requirements: documentation control, auditable records.
S21 Record information

Core Theme: Communicating with others		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Uses communication methods and techniques and industry terminology suitable for the context. (K29, S19)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		
Time of observation		
Fail		☐
Pass		☐

K29 Non-written communication methods and techniques. Engineering maintenance terminology.
S19 Communicate with others to give and receive information. For example, colleagues, customers, and stakeholders.

Specialist Option: Electrical and control and instrumentation engineering maintenance technician - Theme: Conducting planned electrical and control and instrumentation maintenance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Confirms safe electrical isolation (lockout tagout) method has been applied and tests for dead in line with task requirements and company procedures. (K34, K46, S27, S36, S43)	☐	
Pass: Conducts and confirms isolation of connected services in line with task requirements and company procedures. (K34, K46, S27, S36, S43)	☐	
Pass: Re-connects instrumentation power supply, cables, pipework, and services in line with task requirements and company procedures. (K34, K46, S27, S36, S43)	☐	
Pass: Conducts and confirms electrical and connected services deisolation in line with task requirements and company procedures. (K34, K46, S27, S36, S43)	☐	
Pass: Selects electrical and control and instrumentation maintenance tools, measurement, and test equipment to meet task requirements. Checks to ensure functionality, and uses in line with operation, care and calibration requirements. (K42, K54, S28)	☐	
Pass: Conducts planned electrical maintenance in line with task requirements and company procedures including inspecting and testing electrical aspects of	☐	

Specialist Option: Electrical and control and instrumentation engineering maintenance technician - Theme: Conducting planned electrical and control and instrumentation maintenance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
plant, removing and replacing electrical parts, setting up and adjusting electrical aspects of plant, and cleaning parts. (K41, S31, S32, S34, S35)		
Pass: Conducts planned control and instrumentation maintenance in line with task requirements and company procedures including inspecting and testing control and instrumentation systems, checking calibration and making adjustments, checking loop function, setting up and adjusting control and instrumentation systems, cleaning parts, and removing and replacing instruments and sensors. (K53, S38, S39, S40, S41, S42)	☐	
Pass: Conducts functional testing to confirm operation in line with task requirements and company procedures (S37)	☐	
Distinction: Justifies their approach to planned electrical maintenance. (K41, S31, S32, S34, S35, S37)	☐	
Distinction: Justifies their approach to planned control and instrumentation maintenance. (K53, S38, S39, S40, S41 ,S42)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		

Specialist Option: Electrical and control and instrumentation engineering maintenance technician - Theme: Conducting planned electrical and control and instrumentation maintenance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Time of observation	
Fail	☐
Pass	☐
Distinction	☐

Electrical and control and instrumentation engineering maintenance technician:
K34 Electrical isolation and deisolation requirements: lockout tagout and testing for dead.
K41 Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.
K42 Electrical maintenance tools, measurement and test equipment application, operation, care and calibration requirements.
K46 Isolation and deisolation of connected services considerations and requirements.
K53 Control and instrumentation equipment and control systems maintenance requirements and methods: removing and replacing instruments and sensors, inspecting, testing, cleaning, setting up, calibration, and functional testing.
K54 Control and instrumentation maintenance tools and equipment application, operation, care and calibration requirements.
S27 Confirm safe electrical isolation lockout tagout method has been applied and test for dead.
S28 Select, check, and use electrical maintenance tools, measurement, and test equipment. Select, check, and use control and instrumentation maintenance tools, measurement, and test equipment.
S31 Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.
S32 Remove and replace electrical parts.
S34 Set up and adjust electrical aspects of plant.
S35 Clean parts. For example, removal of dust and debris.
S36 Conduct and confirm electrical and connected services isolation and deisolation.
S37 Conduct functional testing.
S38 Inspect and test control and instrumentation systems.
S39 Check calibration and make adjustments.
S40 Check loop function.

S41 Set up and adjust control and instrumentation systems.
S42 Remove and replace instruments and sensors.
S43 Re-connect instrumentation power supply, cables, pipework, and services.

Specialist Option Electrical and mechanical engineering maintenance technician – Theme: Conducting planned electrical and mechanical maintenance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Confirms safe electrical isolation, lockout tagout, method has been applied and tests for dead in line with task requirements and company procedures. (K58, K70, S44, S45)	☐	
Pass: Conducts and confirms isolation of connected services in line with task requirements and company procedures. (K58, K70, S44, S45)	☐	
Pass: Conducts and confirms electrical and connected services deisolation in line with task requirements and company procedures. (K58, K70, S44, S45)	☐	
Pass: Selects electrical and mechanical maintenance tools, measurement, and test equipment to meet task requirements. Checks to ensure functionality, and uses in line with operation and care requirements. (K66, K75, S46)	☐	
Pass: Conducts planned electrical maintenance in line with task requirements and company procedures including inspecting and testing electrical aspects of	☐	

Specialist Option Electrical and mechanical engineering maintenance technician – Theme: Conducting planned electrical and mechanical maintenance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
plant, removing and replacing electrical parts, setting up and adjusting electrical aspects of plant, and cleaning parts. (K65, S49, S50, S52, S53)		
Pass: Conducts planned mechanical maintenance in line with task requirements and company procedures including checking condition and operation of mechanical aspects of plant and equipment, removing and replacing mechanical parts, examining mechanical parts for defects, setting up and adjusting mechanical aspects of plant, cleaning parts, and lubricating mechanical assemblies. (K74, S55, S56, S57, S58, S59)	☐	
Pass: Conducts functional testing to confirm operation in line with task requirements and company procedures. (S54)	☐	
Distinction: Justifies their approach to planned electrical maintenance. (K65, S49, S50, S52, S53)	☐	

Specialist Option Electrical and mechanical engineering maintenance technician – Theme: Conducting planned electrical and mechanical maintenance		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptors	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Distinction: Justifies their approach to planned mechanical maintenance. (K74, S55, S56, S57, S58, S59)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above. Ask questions to assess the KSBs that did not occur naturally during the observation with questions.		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Time of observation	
Fail	☐
Pass	☐
Distinction	☐

Electrical and mechanical engineering maintenance technician.

K58 Electrical isolation and deisolation requirements: lockout tagout and testing for dead.
K65 Electrical plant, equipment, and systems maintenance requirements: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and functional testing.
K66 Electrical maintenance tools, measurement, and test equipment application, operation, care and calibration requirements.
K70 Isolation and deisolation of connected services considerations and requirements.
K74 Mechanical maintenance requirements and techniques: removing and replacing parts, inspecting, testing, setting up, adjusting, cleaning, and lubricating.
K75 Mechanical maintenance tools and equipment application, operation, care, and calibration requirements.
S44 Confirm safe electrical isolation lockout tagout method has been applied and test for dead.

S45 Conduct and confirm electrical and connected services isolation and deisolation.
S46 Select, check, and use electrical and mechanical maintenance tools, measurement, and test equipment.
S49 Inspect and test electrical aspects of plant. For example, visual checks, insulation and continuity checks, thermographic surveys, and voltage levels.
S50 Remove and replace electrical parts.
S52 Set up, align, and adjust electrical aspects of plant.
S53 Clean parts. For example, removal of dust and debris.
S54 Conduct functional testing.
S55 Check condition and operation of mechanical aspects of plant and equipment. For example, pumps.
S56 Remove and replace mechanical parts.
S57 Examine mechanical parts for defects. For example, pump seals.
S58 Set up, align, and adjust mechanical aspects of plant.
S59 Lubricate mechanical assemblies.

Appendix F: Practice Interview Based on an EPA Portfolio Template

Employers/training providers are recommended to arrange for apprentices to carry out a practice Interview based on an EPA portfolio of evidence prior to end-point assessment.

Instructions

This should be read in conjunction with the EMT – Dual Discipline Specification.

This template has been designed to help the suitable person playing part of the independent assessor and has three purposes:

1. To prepare for a practice assessment
2. Designed to holistically assess a broad range of the skills, knowledge and behaviours developed over the period of the apprenticeship by the apprentice
3. To provide feedback to the apprentice in preparation for the live assessment

The assessor should:

- complete the form below which has two parts to assess the apprentice's Interview.
- review the apprentice's portfolio of evidence before the practice assessment

Quick Tip – How to complete the form below:

Full Name of Apprentice	
Apprentice ID checked	
Location of End-point Assessment	
Employer Company Name	
Training Provider Name	
Full Name of The Person Playing the Role of the Independent Assessor	
Date of Interview	
Start Time	
End Time	
Practice – Independent Assessor playing the role: Summary	

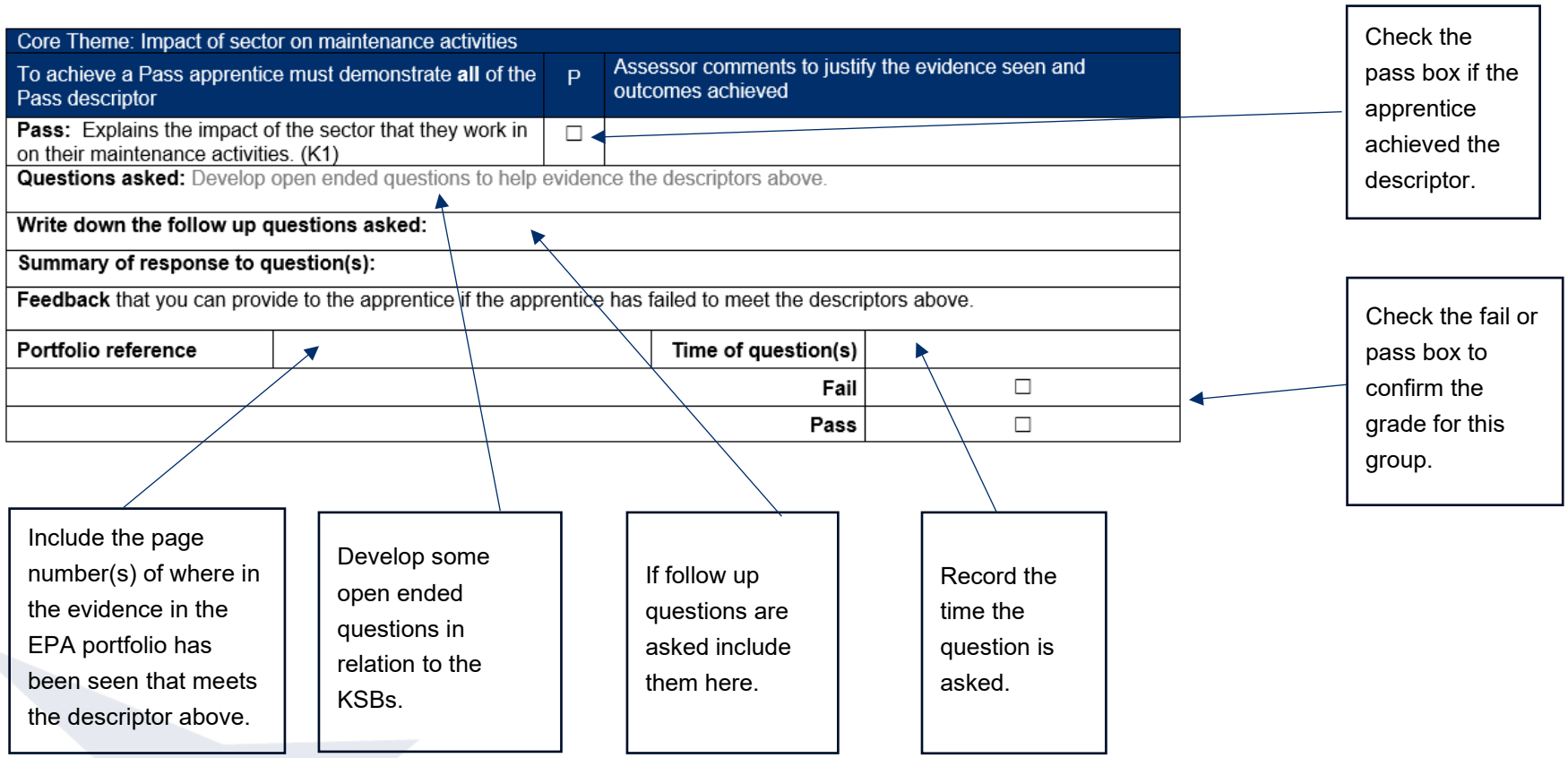
Please indicate the apprentice's practice interview grade	Distinction	Pass	Fail
	☐	☐	☐

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

Independent Assessor Full Name and Signature:	**Date:**

It is important to ensure that the page illustrated is completed by the assessor.

The assessor should write additional comments to support the practice grade decision, sign and date to confirm.



Engineering Maintenance Technician – Dual Discipline Interview

Full Name of Apprentice	
Apprentice ID checked	
Location of End-point Assessment	
Employer Company Name	
Training Provider Name	
Full Name of The Person Playing the Role of the Independent Assessor	
Date of Interview	
Start Time	
End Time	
Practice – Independent Assessor playing the role: Summary	

Please indicate the apprentice's practice interview grade	Distinction	Pass	Fail
	☐	☐	☐

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

Independent Assessor Full Name and Signature:	**Date:**

Please Note:

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

To achieve a Distinction the Apprentice must achieve **all** of the pass and distinction descriptors.

Fail: The apprentice does not demonstrate the pass descriptors.

Assessor questions: during the live assessment, the assessor must ask at least 10 open questions.

Introduction
At the start of the interview the assessor will: • Introduce themselves • State their role • State the date of the interview • Request and confirm ID from the apprentice prior to beginning the assessment • 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's 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 question and answer session; 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
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 • Please do not consider me rude if I tell you that we need to move onto the next question. This will ensure that you get the opportunity to fully demonstrate your competencies within the time allowed • Ensure the apprentice has a drink of water to hand • Please ensure that your mobile is switched off or placed somewhere where you will not be interrupted during the interview • Confirm that a sign is placed on the door of the assessment room. Assessment in progress 'Do not disturb' • The live interview will be fully recorded for the purpose of audit and quality assurance

Independent Assessor Guidance

Delivery
• The interview will last 90 minutes (1 hour 30 minutes). An additional 9 minutes is allowed for the apprentice to complete their last answer
• You must be in full control. Time management is key! If the apprentice veers off track, they need to be reined back in
• You must ask a minimum of eight open questions
• The purpose of the questions is to cover the following core and one of the specialist option topics:
  ○ **Core:** Impact of sector on maintenance activities; roles and responsibilities; work sustainability; participating in continuous improvement; teamworking; produce written documents; and digital and information technology
  ○ **Specialist Option: Electrical and control and instrumentation engineering maintenance technician:** Electrical and control and instrumentation problem solving and fault finding; cable installation and termination
  ○ **Specialist Option: Electrical and mechanical engineering maintenance technician:** Electrical and mechanical maintenance problem solving and fault-finding; cable installation and termination; bench fitting techniques
• Please work through the sections in the order they appear within this document
• Answers to questions must be recorded. Timeline each question to the recording. Only log the time for the start of each question asked
• Additional follow-up questions are allowed to seek clarification and to make a judgement against grading descriptor
• The text of additional questions must be recorded on this document
• Adapt the questions to the apprentice's circumstances following your review of their EPA portfolio evidence
• Write down each question
• Supply brief written notes where each criterion has been met
• If the apprentice does not achieve a descriptor, provide written notes that EEA can feed back to the apprentice to help the apprentice prepare for a resit
• Both the recording and the written notes will be subject to IQA.
 	
At the end of the interview - Thank the apprentice for their time and wish them good luck

Core Theme: Impact of sector on maintenance activities			
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor		P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Explains the impact of the sector that they work in on their maintenance activities. (K1)		☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.			
Write down the follow up questions asked:			
Summary of response to question(s):			
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K1 Sectors in which engineering maintenance takes place. Impact of sector on maintenance activities.

Core Theme: Roles and responsibilities		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptors	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Outlines their role as a maintenance technician including their limits of responsibility and how they escalate issues in line with company procedures. (K3 and S20)	☐	
Pass: Describes how they respond and adapt to meet demands in their work with different maintenance disciplines and functional areas. (K2 and S4)	☐	
Pass: Describes how they have or would respond in an emergency situation in line with their company's emergency incident procedures. (K16 and S10)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K2: Maintenance disciplines and functional areas and how they work together.
K3: Individual maintenance technician's roles and responsibilities. Escalation procedures.
K16: Emergency incident and response procedures.
S4: Respond and adapt to work demands. For example, adapt working methods to reflect changes in working environment, re-prioritise workloads to react to breakdowns and fault scenarios.
S10: Follow emergency incident and response procedures.
S20: Escalate issues outside limits of responsibility.

Core Theme: Work sustainability		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptor	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they consider and apply principles of sustainability when using resources and carrying out tasks to support the UK's net zero commitment. (K14, S11 and B2)	☐	
Distinction: Justifies the application of sustainability practices in maintenance activities. (K14, S11, B2)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐
		Distinction	☐

K14: The UK's net zero commitment. Principles of sustainability.
S11: Apply sustainability principles. For example, minimising waste.
B2: Consider sustainability when using resources and carrying out tasks.

Core Theme: Participating in continuous improvement		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptor	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they have applied continuous improvement (CI) techniques to identify viable suggestions to support their company's CI system. (K26 and S25)	☐	
Pass: Describes planned and unplanned learning and development activities they have carried out and recorded to meet personal development needs, showing a commitment to future CPD. (S26 and B5)	☐	
Distinction: Justifies the potential impact of the improvement suggestions with consideration to benefits and potential risks. (K26 and S25)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐
		Distinction	☐

K26: Continuous improvement (CI) systems and techniques

S25: Apply continuous improvement techniques to identify improvement suggestions.
S26: Carry out and record planned and unplanned learning and development activities.
B5: Committed to continued professional development to maintain and enhance competence.

Core Theme: Teamworking		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they apply team working principles to meet work goals and support inclusivity in line with their company's policy on equity, diversity, and inclusion. (K27; K28; S18 and B4)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K27: Team working principles.
K28: Principles of equity, diversity, and inclusion in the workplace.
S18: Apply team working principles.
B4: Team-focus to meet work goals and support inclusivity. For example, support others, show respect to others, and create and maintain productive working relationships.

Core Theme: Produce written documents			
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor	P/	Assessor comments to justify the evidence seen and outcomes achieved	
Pass: Describes how they apply written communication techniques to produce or amend documents in their work that are suitable for the context. (K30 and S22)	☐		
Questions asked: Develop open ended questions to help evidence the descriptors above.			
Write down the follow up questions asked:			
Summary of response to question(s):			
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K30: Written communication techniques.
S22:Produce or amend documents. For example, handover notes and reports.

Core Theme: Digital and information technology		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they use digital and information technology in their work in compliance with their organisation's cyber security requirements and the General Data Protection Regulation (GPDR). (K31and S24)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K31: Digital and information technology to support engineering maintenance. General data protection regulation (GDPR). Cyber security.
S24: Use digital and information technology. For example, databases, data sharing platforms, email, management information systems, and word processing. Follow cyber security and GDPR requirements.

Specialist Option: Electrical and control and instrumentation engineering maintenance technician - Theme: Electrical and control and instrumentation maintenance problem solving and fault-finding		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptor	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they use electrical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques identify and rectify common electrical plant, equipment, and systems failure modes in line with task requirements and company procedures. (K43, K44, K45, K55, K56, S29, S30)	☐	
Pass: Describes how they use control and instrumentation diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques to identify and rectify common control and instrumentation system failure modes in line with task requirements and company procedures. (K43, K44, K45, K55, K56, S29, S30)	☐	
Distinction: Justifies diagnostic methods they have used in the identification and rectification of electrical plant and equipment faults and system failure modes. (K43, K55, S30)	☐	
Distinction: Justifies diagnostic methods they have used in the identification and rectification of control and instrumentation system failure modes. (K43, K55, S30)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		

Summary of response to question(s):			
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐
		Distinction	☐

K43 Common electrical plant, equipment, and systems failure modes.
K44 Electrical fault-finding and rectification techniques; diagnostic equipment.
K45 Problem solving and critical reasoning techniques.
K55 Common control and instrumentation equipment and control system failure modes.
K56 Control and instrumentation maintenance fault-finding and rectification techniques; diagnostic equipment.
S29 Use electrical diagnostic equipment and apply fault finding and rectification techniques. Use control and instrumentation diagnostic equipment and apply fault finding and rectification techniques.
S30 Apply problem solving and critical reasoning techniques.

Specialist Option: Electrical and control and instrumentation maintenance technician - Theme: Cable installation and termination		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they prepare and terminate cables using methods in line with the task requirements and company procedures. (K40, S33)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K40: Cable termination methods.
S33: Prepare and terminate electrical cables.

Specialist Option: Electrical and mechanical engineering maintenance technician - Theme: Electrical and mechanical maintenance problem solving and fault-finding		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptor	P/D	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they use electrical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques identify and rectify common electrical plant, equipment, and systems failure modes in line with task requirements and company procedures. (K67, K68, K69, K76, K77, S47, S48)	☐	
Pass: Describes how they use mechanical diagnostic equipment and apply fault finding, rectification, problem solving, and critical reasoning techniques to identify and rectify common problems relating to mechanical aspects of plant and equipment in line with task requirements and company procedures. (K67, K68, K69, K76, K77, S47, S48)	☐	
Distinction: Justifies diagnostic methods they have used in the identification and rectification of electrical plant and equipment faults and system failure modes. (K67, K76, S48)	☐	
Distinction: Justifies diagnostic methods they have used in the identification and rectification of issues relating to mechanical aspects of plant and equipment. (K67, K76, S48)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		

Write down the follow up questions asked:			
Summary of response to question(s):			
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.			
Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐
		Distinction	☐

K67 Common electrical plant, equipment, and systems failure modes.
K68 Electrical fault-finding and rectification techniques; diagnostic equipment.
K69 Problem solving and critical reasoning techniques.
K76 Common maintenance problems relating to mechanical aspects of plant and equipment.
K77 Mechanical maintenance fault-finding and rectification techniques; diagnostic equipment.
S47 Use electrical and mechanical diagnostic equipment and apply fault finding and rectification techniques.
S48 Apply problem solving and critical reasoning techniques.

Specialist Option: Electrical and mechanical engineering maintenance technician - Theme: Cable installation and termination		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor To achieve a Distinction apprentice must demonstrate **all** of the Pass descriptors and **all** of the distinction descriptor	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they prepare and terminate cables using methods in line with the task requirements and company procedures. (K64, S51)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐
		Distinction	☐

K64 Cable termination methods.
S51 Prepare and terminate electrical cables.

Specialist Option: Electrical and mechanical engineering maintenance technician - Theme: Bench fitting techniques		
To achieve a Pass apprentice must demonstrate **all** of the Pass descriptor	P	Assessor comments to justify the evidence seen and outcomes achieved
Pass: Describes how they apply bench fitting techniques including cutting threads, mechanical fitting, and joining in line with task requirements and company procedures. (K78, S60)	☐	
Questions asked: Develop open ended questions to help evidence the descriptors above.		
Write down the follow up questions asked:		
Summary of response to question(s):		
Feedback that you can provide to the apprentice if the apprentice has failed to meet the descriptors above.		

Portfolio reference		**Time of question(s)**	
		Fail	☐
		Pass	☐

K78 Bench fitting techniques: cutting threads, mechanical fitting, and joining.
S60 Apply bench fitting techniques.