City & Guilds Level 3 End-point Assessment for Engineering Maintenance Technician (Single Discipline) (9331-11)

302 Control and Instrumentation Engineering Maintenance Technician

Standard: ST1426, EPA Plan: Version 1.0

QN: 610/6875/5

Version 1.0

Last modified: June 2026

Sample Knowledge Test
Sample paper, multiple-choice answer sheet and mark scheme

Version	Summary of changes	Section
1.0 June 2026	Document created	N/A

1 Introduction

Area	Description
What is in this document	This document contains the sample test, answer sheet and mark scheme for the 9331-11 Engineering Maintenance Technician (Single Discipline) Multiple-choice Test (302 Control and instrumentation engineering maintenance technician).
Documents included:	• Sample questions • Answer sheet • Mark scheme Apprentices should be provided with the sample questions and the answer sheets. The mark scheme is to be used by employers/training providers/tutors to mark the completed test.

Note to employers/training providers/tutors: this sample paper-based version of the multiple-choice test is to support formative assessment activities.

Live versions of the multiple-choice test will be accessed using City & Guilds e-volve online system. Please refer to the EPA handbook for details on how to book and administer live tests.

2 9331-302 End-point Assessment – multiple-choice knowledge test (sample questions)

Test duration: 60 minutes

You should have the following for this test:

- a pen with black or blue ink
- multiple-choice questions answer sheet.

Read the following notes before you answer any questions.

- Attempt all questions.
- If you find a question difficult, leave it and return to it later.

This paper contains 40 multiple-choice questions worth 1 mark each.

This test paper is the property of City & Guilds.

How to complete the multiple-choice answer sheet

Each multiple-choice question shows four possible answers (lettered ‘a’, ‘b’, ‘c’, ‘d’); only one is correct.

Decide which one is correct and mark your answer on the answer sheet with your pen.

For example, if you decide ‘b’ is correct, mark your answer with a cross like this:

1 a ☐ b ☒ c ☐ d ☐

If you change your answer, cancel your first choice by filling in the box then put a cross in the answer which you have now decided is correct, like this:

1 a ☐ b ■ c ☒ d ☐

Q1	Which stage of the equipment life cycle involves site preparation, alignment and initial testing? (1 mark)
	a) Concept and planning. b) Design and procurement. c) Installation and commissioning. d) Operation and utilisation.
Spec reference	6.1.1 (c)

Q2	Which statement **best** describes condition-based maintenance (CBM)? (1 mark)
	a) Maintenance that is a holistic approach aiming for zero defects and breakdowns. b) Maintenance that is reactive and only performed after equipment failure. c) Maintenance that takes place at fixed intervals to prevent failure. d) Maintenance triggered by monitored data indicating degradation.
Spec reference	7.1.1 (b)

Q3	A safety risk has a likelihood rating of 3 and an impact rating of 2. What is the risk score? (1 mark)
	a) 0.66. b) 1.5. c) 5. d) 6.
Spec reference	7.2.1 (a)

Q4	What is the **primary** legislation that sets the overarching duties for health, safety and welfare at work? (1 mark)
	a) DSEAR. b) HSWA. c) LOLER. d) PUWER.
Spec reference	8.1.2 (a)

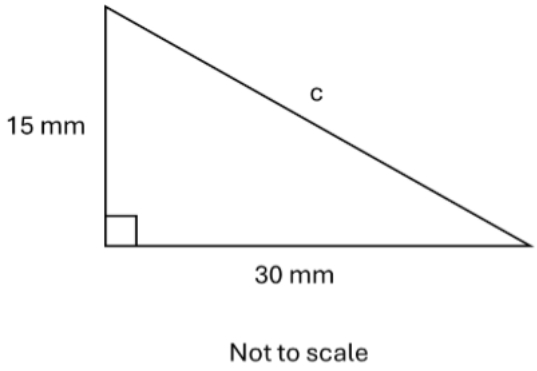
Q5	Which health and safety regulation covers the safe use of computer screens? (1 mark)
	a) DSE. b) PPE. c) COSHH. d) COMAH.
Spec reference	8.1.4 (b)

Q6	According to RIDDOR, how many consecutive days must an injury stop a worker from doing their usual job for before it must be reported to the HSE? (1 mark)
	a) More than two days. b) More than three days. c) More than five days. d) More than seven days.
Spec reference	8.2.5 (a)

Q7	An engineer is employed by a maintenance engineering company. According to the PPE Regulations, what is a responsibility of the engineer prior to completing a maintenance activity? (1 mark)
	a) To alter the condition of PPE for the activity. b) To complete a risk assessment to determine the PPE for the task. c) To inspect PPE for any damage before using it in the activity. d) To provide PPE to other employees who are completing the activity.
Spec reference	8.2.7 (a) (ii)

Q8	Which standard gives the requirements for an Environmental Management System? (1 mark)
	a) BS 7671. b) BS 8888. c) ISO 9001. d) ISO 14001.
AO	AO1a
Spec reference	K13.1.1 (a)

Q9	A minor spill has occurred that poses no immediate danger. What should be the **first** action according to spill response procedures? (1 mark)
	a) Attempt to contain the spillage. b) Evacuate the area affected. c) Clean the area affected. d) Document the incident.
Spec reference	13.2.1 (d)

Q10	The support bracket below forms a right angle. What is the length of side c to the nearest whole number?  Not to scale (1 mark)
	a) 28 mm. b) 34 mm. c) 40 mm. d) 45 mm.
Spec reference	17.1.1 (e)

<table>
<tr><td>Q11</td><td>A series of holes in a material have the diameters shown in the table below.
What is the mean diameter of the holes to one decimal place?

All dimensions in mm.

<table><tr><td>9.8</td><td>9.9</td><td>9.7</td><td>9.9</td></tr><tr><td>10.0</td><td>9.8</td><td>9.9</td><td>9.7</td></tr></table>
(1 mark)</td></tr>
<tr><td></td><td>a) 9.6 mm.

b) 9.7 mm.

c) 9.8 mm.

d) 9.9 mm.</td></tr>
<tr><td>Spec reference</td><td>17.2.1 (a)</td></tr>
</table>

<table>
<tr><td>Q12</td><td>What property is described as the ability of material to resist scratches and indentations?

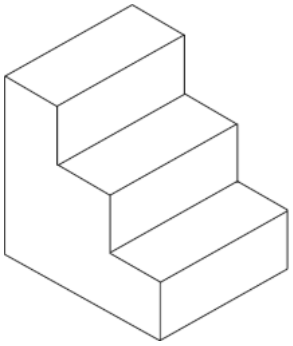
(1 mark)</td></tr>
<tr><td></td><td>a) Hardness.

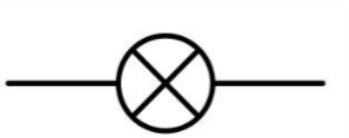
b) Magnetism.

c) Ductility.

d) Strength.</td></tr>
<tr><td>Spec reference</td><td>18.1.1 (c)</td></tr>
</table>

Q13	What does contact between two incompatible metals in the presence of an electrolyte result in? (1 mark)
	a) Corrosion of both metals at the same speed. b) Faster corrosion of the more active metal. c) Faster corrosion of the less active metal. d) No corrosion of either of the two metals.
Spec reference	18.2.1 (d)

Q14	What type of engineering representation format is shown below?  (1 mark)
	a) Detail. b) Assembly. c) Isometric. d) Orthographic.
Spec reference	21.1.1 (d)

Q15	What does this symbol represent on an electrical circuit diagram?  (1 mark)
	a) Lamp. b) Resistor. c) Signal diode. d) Light emitting diode.
Spec reference	21.2.1 (c)

Q16	Which **best** describes the application of the Internet of Things (IoT) in maintenance? (1 mark)
	a) Connected sensors that share data in real time. b) Remote access to data via cloud filesharing services. c) Use of physical equipment integrated with digital control. d) Use of pre-programmed robots to perform system repairs.
Spec reference	32.1.1 (b)

Q17	Which technology can be used to analyse data trends to support predictive maintenance? (1 mark)
	a) IoT. b) AI. c) HMI. d) PLC.
Spec reference	32.2.1 (d)

Q18	What is the role of digital twins in maintenance? (1 mark)
	a) To use virtual models to design brand new products from scratch. b) To use physical models of digital systems to simulate their performance. c) To use virtual models of physical systems to simulate their performance. d) To use virtual models to simulate system components that are not physically possible to make.
Spec reference	32.3.1 (c)

Q19	A maintenance engineer has been asked to replace a faulty power supply for a DC motor. The motor has a resistance of 50 Ω and draws a current of 0.24 A when in use. What voltage power supply should be used for the DC motor? (1 mark)
	a) 0.005 V. b) 12 V. c) 50.2 V. d) 208 V.

Spec reference	S13.1.1 (a) (i)

Q20	A maintenance engineer is tightening a bolt as part of re-assembling a machine. They are using a wrench that is 0.2 metres in length. The engineer applies a force of 90 N at a right angle to the end of the wrench handle. What is the amount of torque applied to the bolt? (1 mark)
	a) 450 Nm. b) 90.2 Nm. c) 18 Nm. d) 0.002 Nm.
Spec reference	S13.1.1 (a) (iii)

Q21	What is the employee's **primary** responsibility when working on electrical equipment? (1 mark)
	a) Follow the employer's safety procedures and processes. b) Follow their own safety procedures and processes. c) Follow industry safety procedures and processes. d) Follow the manufacturer's safety procedures and processes.
Spec reference	46.1.2 (a)

Q22	Which statement **best** defines the relationship between BS 7671 and Electricity at Work Regulations (EAWR)? (1 mark)
	a) BS 7671 is statutory law and EAWR is a supporting code of practice. b) EAWR and BS 7671 are legal acts of parliament that must be followed by law. c) BS 7671 provides technical standards that support compliance with EAWR. d) BS 7671 sets out employer responsibilities for electrical safety training under EAWR.
Spec reference	46.3.1 (a)

Q23	What is the **main** purpose of a Permit to Work document? (1 mark)
	a) To provide basic safety guidance for employees who have not received any formal training. b) To authorise and control high risk work and ensure safety measures are in place. c) To increase operational efficiency by removing the need for routine safety checks. d) To ensure employees are provided with guidance on what to do when accidents occur.
Spec reference	46.4.2 (b)

Q24	Which is a typical reason why closed-loop systems are used instead of open-loop systems? (1 mark)
	a) Lower cost. b) Lower complexity. c) Easier to maintain. d) Gives consistent output.
Spec reference	49.1.1 (f) (i)

Q25	What is an actuator? (1 mark)
	a) A device that converts environmental signals into control signals. b) A device that converts control signals into mechanical movement. c) A device that changes analogue control signals into digital signals. d) A device that processes control signals and sends them to an output device.
Spec reference	49.2.1 (b) (i)

Q26	A control system transfers 120 W of power and draws a current of 5 A. What is the voltage of the system? (1 mark)
	a) 2 V. b) 24 V. c) 125 V. d) 600 V.
Spec reference	49.3.1 (a) (i)

Q27	Which type of control system is **best** described as one that decentralises control functions across multiple interconnected controllers? (1 mark)
	a) SCADA. b) PAC. c) DCS. d) PLC.
Spec reference	50.1.1 (b) (iv)

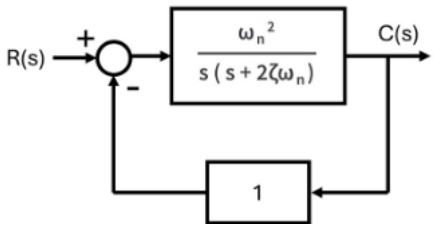
Q28	What is the purpose of a Human Machine Interface (HMI) within a control and instrumentation system? (1 mark)
	a) To allow operators to interact with the system in a user-friendly way. b) To allow operators direct access to underlying system program data. c) To allow the system to run independently of user input. d) To allow the system to function without sensor inputs.
Spec reference	50.1.1 (e) (i)

Q29	Which type of cable transmits data as pulses of light? (1 mark)
	a) Coaxial. b) Multipair. c) Multicore. d) Fibre-optic.
Spec reference	50.2.4 (c)

Q30	What type of device generates a voltage under pressure? (1 mark)
	a) Piezoelectric sensor. b) Capsule sensor. c) Bourdon tube. d) Strain gauge.
Spec reference	51.1.1 (b) (iv)

Q31	Which device makes use of the Seebeck effect? (1 mark)
	a) Thermistor. b) Thermocouple. c) Infrared sensor. d) Resistance Temperature Detector.
Spec reference	51.1.2 (a) (ii)

Q32	What is a logic solver? (1 mark)
	a) A transducer within a Safety Instrumented System (SIS). b) A transmitter within a Safety Instrumented System (SIS). c) A controller within a Safety Instrumented System (SIS). d) A sensor within a Safety Instrumented System (SIS).
Spec reference	51.2.2 (b)

Q33	What type of control system is this?  (1 mark)
	a) First order system. b) Second order system. c) Open-loop system. d) Non-feedback system.
Spec reference	52.2.1 (a)

Q34	What is the function of the Integral term within a three-term controller? (1 mark)
	a) To create new errors. b) To predict future errors. c) To respond to the current error. d) To eliminate steady state errors.
Spec reference	52.3.1 (a) (iii)

Q35	Which method of programming mimics relay circuitry? (1 mark)
	a) Text-based. b) Flow charts. c) Ladder logic. d) Function blocks.
Spec reference	53.1.1 (c) (i)

Q36	Which is the **most** typical application of a Direct Digital Control (DDC) system? (1 mark)
	a) Small-scale automation. b) High-speed industrial automation. c) Large building HVAC automation. d) Safety-critical industrial process automation.
Spec reference	53.1.2 (b) (ii)

Q37	Which cybersecurity mitigation strategy scrambles readable data into unreadable code using a key? (1 mark)
	a) Firewall. b) Antivirus. c) Passwords. d) Encryption.
Spec reference	53.3.1 (b) (iv)

Q38	What type of diagram shows a high-level representation of groups of system components, with arrows representing signal flow between them? (1 mark)
	a) Block diagram. b) Circuit diagram. c) Wiring diagram. d) Schematic diagram.
Spec reference	54.1.1 (c) (i)

Q39	What does a solid thick line represent on an engineering drawing? (1 mark)
	a) Visible outline. b) Hidden outline. c) Centre line. d) Leader line.
Spec reference	54.1.4 (b) (i)

Q40	Which item of information is found in a drawing title block? (1 mark)
	a) Complete revision history. b) Specific part dimensions. c) Scale of the drawing. d) Full bill of materials.
Spec reference	54.2.1 (a) (iii)

3 9331-302 End-point Assessment – multiple-choice knowledge test (answer sheet)

Candidate name:

Date of test: Click or tap to enter a date.

1	a ☐	b ☐	c ☐	d ☐
2	a ☐	b ☐	c ☐	d ☐
3	a ☐	b ☐	c ☐	d ☐
4	a ☐	b ☐	c ☐	d ☐
5	a ☐	b ☐	c ☐	d ☐
6	a ☐	b ☐	c ☐	d ☐
7	a ☐	b ☐	c ☐	d ☐
8	a ☐	b ☐	c ☐	d ☐
9	a ☐	b ☐	c ☐	d ☐
10	a ☐	b ☐	c ☐	d ☐
11	a ☐	b ☐	c ☐	d ☐
12	a ☐	b ☐	c ☐	d ☐
13	a ☐	b ☐	c ☐	d ☐
14	a ☐	b ☐	c ☐	d ☐
15	a ☐	b ☐	c ☐	d ☐
16	a ☐	b ☐	c ☐	d ☐
17	a ☐	b ☐	c ☐	d ☐
18	a ☐	b ☐	c ☐	d ☐
19	a ☐	b ☐	c ☐	d ☐
20	a ☐	b ☐	c ☐	d ☐
21	a ☐	b ☐	c ☐	d ☐
22	a ☐	b ☐	c ☐	d ☐

23	a ☐	b ☐	c ☐	d ☐
24	a ☐	b ☐	c ☐	d ☐
25	a ☐	b ☐	c ☐	d ☐
26	a ☐	b ☐	c ☐	d ☐
27	a ☐	b ☐	c ☐	d ☐
28	a ☐	b ☐	c ☐	d ☐
29	a ☐	b ☐	c ☐	d ☐
30	a ☐	b ☐	c ☐	d ☐
31	a ☐	b ☐	c ☐	d ☐
32	a ☐	b ☐	c ☐	d ☐
33	a ☐	b ☐	c ☐	d ☐
34	a ☐	b ☐	c ☐	d ☐
35	a ☐	b ☐	c ☐	d ☐
36	a ☐	b ☐	c ☐	d ☐
37	a ☐	b ☐	c ☐	d ☐
38	a ☐	b ☐	c ☐	d ☐
39	a ☐	b ☐	c ☐	d ☐
40	a ☐	b ☐	c ☐	d ☐

Number of correct answers: **/ 40**

4 9331-302 End-point Assessment – multiple-choice knowledge test (mark scheme)

Grading

Fail – 27 marks (67.5%)

Pass – 28 marks (70%)

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

Who we are

City & Guilds Limited (Registered Company 16513878) is the Awarding Organisation for City & Guilds qualifications.

About City & Guilds

City & Guilds is the global skills partner, empowering people, organisations and economies to develop the skills they need for growth. With almost 150 years of trusted expertise, we support people into work, help them develop on the job and move into the next job.

We work with Governments, employers, training providers, colleges and industry stakeholders to design and deliver high-quality training, qualifications, assessments and credentials that lead to meaningful career progression. We understand the life changing link between skills development, social mobility and success. Our solutions span critical sectors including construction, engineering, transport, energy and electrical, serving over 1 million learners annually.

Through our comprehensive portfolio of brands and trusted global network, we set industry-wide standards for technical, behavioural and commercial skills to improve performance and productivity. We believe you can achieve your potential - and we're here to help make it happen.

City & Guilds

5–6 Giltspur Street
London EC1A 9DE
www.cityandguilds.com