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

301 Mechanical Engineering Maintenance Technician

Standard: ST1426, EPA Plan: Version 1.0

QN: 610/6875/5

Version 1.1

Last modified: July 2026

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

Version	Summary of changes	Section
1.0 May 2026	Document created	N/A
1.1 July 2026	Adjustments made to Questions 10, 19, 20, 23, 27, 29 and 30	Pg 9, 14, 15, 17 and 18

Contents

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 (301 Mechanical 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 9331-301 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)

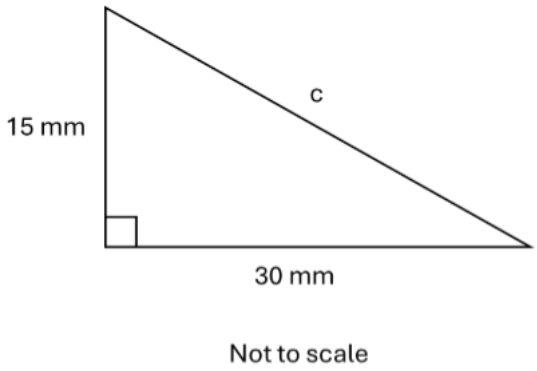
Q6	According to RIDDOR, how many consecutive days must an injury stop a worker from doing their usual job for before it must be reported to the HSE? (1 mark)
	a) More than two days. b) More than three days. c) More than five days. d) More than seven days.
Spec reference	8.2.5 (a)

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.
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	K13.2.1 (d)

Q10	The support bracket below forms a right angle. What is the length of side c to the nearest whole number using the formula $a^2 + b^2 = c^2$  Not to scale (1 mark)

	a) 28 mm. b) 34 mm. c) 40 mm. d) 45 mm.
Spec reference	17.1.1 (e)

Q11	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

9.8	9.9	9.7	9.9
10.0	9.8	9.9	9.7

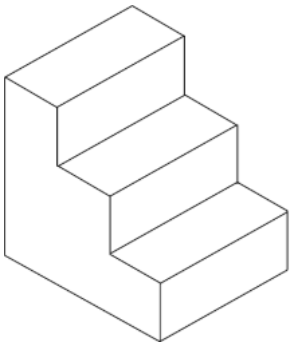
(1 mark)

	a) 9.6 mm. b) 9.7 mm. c) 9.8 mm. d) 9.9 mm.
Spec reference	17.2.1 (a)

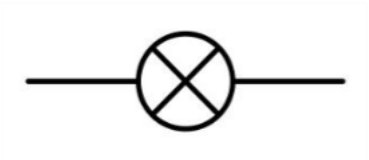
Q12	What property is described as the ability of material to resist scratches and indentations? (1 mark)

	a) Hardness. b) Magnetism. c) Ductility. d) Strength.
Spec reference	18.1.1 (c)

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 using the formula V = I R (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 using the formula $\tau = F \times r \times \sin(\theta)$ (1 mark)
	a) 450 Nm. b) 90.2 Nm. c) 18 Nm. d) 0.002 Nm.
Spec reference	S13.1.1 (a) (iv)

Q21	Why are risk assessments conducted on a regular basis? (1 mark)

	a) To identify potential electrical hazards. b) To check machinery is still functioning. c) To determine the efficiency of the machines. d) To avoid any damage to the machinery.
Spec reference	61.1.1 (c)

Q22	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 your own safety procedures and processes. c) Follow industry safety procedures and processes. d) Follow the manufacturer's safety procedures and processes.
Spec reference	61.1.2 (a)

Q23	A hydraulic press has an input piston with an area of 0.02 m². A force of 50 N is applied to this piston. Using Pascal's Law P = F ÷ A, what pressure is transmitted through the hydraulic fluid? (1 mark)
	a) 125 Pa. b) 2.5 Pa. c) 2500 Pa. d) 0.4 Pa.
Spec reference	62.1.1 (a) (i)

Q24	An air compressor is said to operate between 0 bar g and 10 bar g. What is this referring to?

	(1 mark)
	a) Flow cycle. b) Duty cycle. c) Pressure range. d) Temperature range.
Spec reference	62.2.1 (b) (i)

Q25	Which activity is a maintenance task for hydraulic pumps? (1 mark)
	a) Condensate drainage. b) Lubrication check. c) Contamination control. d) Airflow monitoring.
Spec reference	62.2.2 (d) (iii)

Q26	Which safety precaution is required before working on pneumatic and hydraulic systems? (1 mark)
	a) Controlled release of stored energy. b) Locking off and tagging the energy supply. c) Securing moving parts to prevent unexpected movement. d) Wearing suitable personal protective equipment.
Spec reference	62.3.1 (b)

Q27	A machine component with a mass of 4 kg is accelerating at 3 m/s². According to Newton's Second Law of Motion (F = ma), what force is acting on the component? (1 mark)
	a) 12 N. b) 7 N. c) 1.33 N. d) 0.75 N.
Spec reference	63.1.1 (a)

Q28	Which **best** describes acceleration? (1 mark)
	a) The rate of change of velocity with respect to time. b) The rate of change of speed with respect to direction. c) The rate of change in velocity with respect to direction. d) The rate of change of speed with respect to time.
Spec reference	63.1.2 (a)

Q29	A 10 mm diameter bolt is subjected to a tensile load of 50 N. What is the tensile stress loading in the bolt using formula (σ = F / A) (1 mark)
	a) 0.6366 kPa. b) 6.366 kPa. c) 63.66 kPa. d) 636.6 kPa.
Spec reference	63.2.1 (a) (i)

Q30	A load of 100 kg mass is resting on a smooth, flat surface. A force of 350 N is applied to the load that is just on the point of moving. Using the formula (μ = F / N), what is the coefficient of friction for this application? (1 mark)
	a) 0.357. b) 2.803. c) 3.57. d) 28.03.
Spec reference	63.2.1 (d) (ii)

Q31	What is the **primary** function of a shaft in a mechanical system? (1 mark)
	a) To support linear motion in a hydraulic or pneumatic cylinder. b) To reduce friction and support rotating components. c) To transmit rotational power and torque between components. d) To convert rotational motion into reciprocating motion.
Spec reference	64.1.1 (c)

Q32	How is slip prevention **best** achieved on a belt driven system? (1 mark)
	a) Decrease driver pulley size. b) Decrease belt tension. c) Increase torque. d) Increase wrap angle.

Spec reference	64.1.1 (b) (ii)

Q33	What is the **primary** function of serrated washers? (1 mark)
	a) To increase the torque in nuts and bolts. b) To prevent nuts and bolts from becoming loose. c) To stop damage to the surrounding area. d) To increase the force on the surrounding area.
Spec reference	64.2.1 (a) (ii)

Q34	What are bellows used for on mechanical assemblies? (1 mark)
	a) To heat assemblies. b) To keep assemblies cool. c) To maintain optimal pressure in assemblies. d) To allow for thermal expansion in assemblies.
Spec reference	64.3.1 (b)

Q35	Which material type is **best** suited to be joined using thread-forming self-tapping screws? (1 mark)
	a) Hard metals. b) Soft metals. c) Thin metal. d) Rubber sheets.

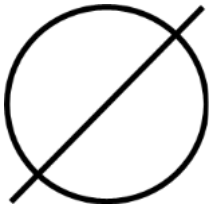
Spec reference	65.1.1 (d) (i)

Q36	Which creates a permanent mechanical joint when assembled? (1 mark)
	a) Split pin. b) Circlips. c) Rivets. d) Screws.
Spec reference	65.1.2 (c)

Q37	What are the SI units of torque? (1 mark)
	a) Nm. b) lb/ft. c) Kg/cm2. d) m/s.
Spec reference	65.1.3 (a)

Q38	Which describes an isometric view on a drawing? (1 mark)
	a) A 2D representation used to show an object or structure from different elevations on a two-dimensional surface. b) A type of 3D representation used to show an object or structure from different elevations on a three-dimensional surface. c) A type of 3D representation used to show an object or structure in three dimensions on a two-dimensional surface.

	d) A 2D representation used to show an object or structure from different elevations on a three-dimensional surface.
Spec reference	66.1.1 (b)

Q39	What does this symbol represent on a standard engineering drawing?  (1 mark)
	a) Radius. b) Threads. c) Countersink. d) Diameter.
Spec reference	66.2.1 (c)

Q40	Which type of diagram is **primarily** used for mechanical fault finding? (1 mark)
	a) Orthographic. b) Schematic. c) Oblique. d) Exploded.

Spec reference	66.1.1 (d)

3 9331-301 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 9331-301 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	A
2	D	22	D
3	D	23	B
4	B	24	C
5	A	25	C
6	D	26	A
7	C	27	A
8	D	28	A
9	A	29	D
10	B	30	A
11	C	31	C
12	A	32	D
13	B	33	B
14	C	34	D
15	A	35	B
16	A	36	C
17	B	37	A
18	C	38	C
19	B	39	B
20	C	40	D

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

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