

Excavator 180

Below 5 tonnes

A10

Technical Test – Theory

Roles and responsibilities	1. What is the definition of, or how can a hazard be described?
	A
	2. What is the purpose of a risk assessment?
	A
	3. List SIX typical subject areas that should be covered in a site induction.
	A
	4. What THREE main duties of the Health and Safety at Work Act must employees follow?
	A
	5. What does the Health and Safety at Work Act require employers to do with regards specifically to plant?
	A
	6. a) What is the purpose of a Method Statement and b) what is required of the operator?
	A
	7. Name FOUR different types or levels of sanctions that can be applied (by employers and judicial bodies) to plant operators who do not comply with, or follow legislation and regulations.
	A
	8. Plant operators are generally regarded as 'safety-critical' workers. What does this mean?
	A

continued...

Excavator 180

Below 5 tonnes

A10

Technical Test – Theory

Roles and responsibilities continued	9. Name THREE ways in which an operator can minimise their impact upon the environment whilst using the machine.
	A
	10. In what situation does a hard hat NOT need to be worn when operating a 180 excavator?
	A
	11. The operator has to fit and use a new bucket using a quick-hitch coupler that they are unfamiliar with. What do Regulations (i.e. PUWER 98) and other guidance require the operator to have?
	A
	12. What are the possible outcomes if being prosecuted (by judicial bodies) for not complying with legislation and regulations?
	A
	13. Give TWO examples of where The Work at Height Regulations may apply to 180 excavator operations.
	A
	14. How can a qualification or card benefit a plant operator?
	A
	15. Name THREE ways that a plant operator can contribute in ensuring repeat business with the client or main contractor.
	A
Preparing for work	16. Where should the excavator's Operator's Manual be kept and why?
	A
	17. If the operator has to top-up the hydraulic oil, state TWO precautions to ensure cleanliness of the system.
A	

continued...

Excavator 180

Below 5 tonnes

A10

Technical Test – Theory

Preparing for work continued	For questions 18 and 19 the Operator's Manual for the machine being used for the test MUST be available for reference by the candidate
	18. Using the Operator's Manual, state the tyres' operating pressure.
	A
	19. Using the Operator's Manual, state the cold-starting procedure for the machine.
	A
	20. If checking the oil level using a dipstick, why must gloves be worn?
	A
	21. Apart from the operator, who else may need to use the machine's Operator's Manual?
	A
	22. What is a possible consequence of using a tyre with a deep cut in the sidewall?
	A
	23. During work, the engine starts to overheat. Explain the danger if someone tries to remove the radiator or expansion tank cap.
	A
	24. Mini 180 excavators may be equipped with a (front) clamshell bucket. Name FOUR possible functions (excluding the forks).
	A
25. What is the purpose of a roll or ROPS frame?	
A	
Travelling and manoeuvring	26. a) Name THREE purposes of the raised lugs on tyres and b) what can happen to an excavator if the lugs are severely worn?
	A
	27. If the excavator is being travelled or working on the public highway, including adjacent pavements and verges, the Road Traffic Act applies. a) What type of licence and which classes should the operator hold and b) what is the minimum age allowed?
A	

continued...

Excavator 180

A10

Below 5 tonnes

Technical Test – Theory

Travelling and manoeuvring continued	28. An operator has been asked to transport a load in the front bucket down a small section of the public highway, for which The Road Traffic Act applies. What effect does this have on operations?
	A
	29. When travelling, why should the rear boom be locked?
	A
	30. Why must the seat belt be worn, even with the cab door closed?
	A
Setting up for work	31. a) What is the minimum distance allowed near open trenches when travelling with a loaded front bucket and b) explain why.
	A
	32. What information does the 'dig-envelope' (also known as 'working range') chart give? (Candidates may be shown a copy of a chart)
	A
	33. Explain ALL visual checks that must be carried out on all types of quick-hitch bucket attaching systems before use.
	A
	34. On a semi-automatic quick-hitch bucket attaching system: a) what is the purpose of the safety pin and b) what checks MUST be made to the pin before use?
	A
	35. Cable avoidance tools (CATs) can detect a variety of buried services. What type of material do they have limitations in locating?
	A
36. Describe ONE physical method of checking that a bucket is fully secured to the quick-hitch coupler prior to work.	
A	

continued...

Excavator 180

A10

Below 5 tonnes

Technical Test – Theory

Setting up for work continued	37. On stabiliser-equipped machines, what must be checked before the stabilisers are lowered?
	A
	38. If setting up to excavate in a confined area, name TWO things that should be taken into account before starting.
	A
	39. What is regarded as the most productive position for a dumper to be in when being loaded with a 180 excavator working from a stockpile?
	A
	40. Name TWO types of equipment used to ensure that excavation levels, measurements and positions are to the required specification.
	A
	41. What particular and specific hazards can affect the stability of the machine when working on old industrial (Brownfield) sites?
	A
	42. If setting up to work in a pedestrianised area, state THREE factors that need to be taken into account.
	A
	43. The operator is asked to excavate a new trench. State FIVE different requirements that must be considered or implemented before work commences.
	A
	44. Before manually changing any bucket: a) where should the bucket be positioned (in relation to the ground) before removing the final pin and b) why?
A	
45. With regards to lifting accessories, irrespective of who supplied the accessories, what THREE factors should be ensured before the accessories are used?	
A	
46. a) What is the recommended minimum distance to be kept away from overhead power lines mounted on wooden poles when setting up the machine to excavate and b) explain why a distance should be kept.	
A	

Excavator 180

A10

Below 5 tonnes

Technical Test – Theory

Working tasks	47. If a trench has a depth of 1.0 metre: a) what is the minimum distance to maintain from the edge of the trench when placing spoil and b) explain why.
	A
	48. Why should different soils be segregated during excavating?
	A
	49. Give THREE reasons why an oversize bucket should not be used when excavating trenches to specification.
	A
	50. If fitted, describe ONE application when the hand throttle can safely be used.
	A
	51. Give FOUR reasons that may cause the excavator to tip over sideways.
	A
	52. Why must excavator operators not begin to load vehicles until the forward tipping dumper driver is clear of their machine?
	A
	53. What makes up the total (or gross) weight of a load that is to be lifted'?
	A
54. What factors determine the shoring requirements of a trench?	
A	
55. Give TWO reasons why, wherever possible, operators should excavate ground in layers.	
A	
56. If a yellow coloured marker tape is unearthed during excavating, which two types of services could this indicate?	
A	
57. What is the nearest distance allowed to gas pipes when excavating with the machine?	
A	

continued...

Excavator 180

A10

Below 5 tonnes

Technical Test – Theory

Working tasks continued	58. What is the meaning of this hand signal (being demonstrated by the Tester)?
	A
	59. The operator is asked to tip material into a trench. State FIVE different requirements that must be considered or implemented before tipping commences.
	A
	60. If loading a dumper, who should determine the maximum load that should be placed into the body?
	A
	61. Explain a possible danger if the excavator is lifting a load on sloping ground, even though the load chart indicates that the machine can lift that load.
	A
	62. Before lowering into or moving a pipe into a trench, what trench-related checks must be made?
	A
Completing work	63. If a load is lifted using the backhoe unit that is inline with the machine, when slewing the load fully to the left or right, the machine can become unstable. Explain why.
	A
	64. If the excavator is carrying out deep excavating work using the full working range, what hazard may occur?
	A
Completing work	65. Describe TWO actions to be taken for an open trench at the end of a working day.
	A
Completing work	66. Before leaving the cab for a rest break, after parking and switching off the machine, what final action must be carried out?
	A

Excavator 180

Below 5 tonnes

A10

Technical Test – Theory

Shutdown	67. When parking the machine at the end of the shift, name THREE places where the machine should NOT be parked.
	A
	68. The operator has been asked to drive the machine onto a transporter/trailer. a) Who is responsible for the loading operations and b) state FOUR actions to be considered by the operator before loading commences.
	A
	69. If the operator has loaded the machine onto a transporter/trailer on behalf of a driver, what checks must be carried out before they leave the cab?
	A
	70. Why should an excavator be re-fuelled at the end of the day?
	A
	71. After shutting down the engine, why should the hydraulic operating levers be cycled?
	A

Excavator 180

Below 5 tonne

A10

Technical Test – Practical

RESOURCES

Required

Machine	<ul style="list-style-type: none"> • 180 Excavator with: <ul style="list-style-type: none"> – standard excavating buckets on the loader and backhoe
Area	<ul style="list-style-type: none"> • Ground, clear of hazards which must include: <ul style="list-style-type: none"> – level area for excavating – rough undulating terrain – slope or slopes – spoil/material to load vehicles
Other equipment	<ul style="list-style-type: none"> • Load-carrying vehicle for spoil/material • A replacement backhoe bucket (for changing task) • Items to create restrictions for manoeuvring • Laser equipped measuring equipment to ensure trench specifications are met • Lifting accessories for the load to be lifted • Measuring tape for measuring the maximum (backhoe) radius of the excavator • Slinger and signaller assistance
Loads	<ul style="list-style-type: none"> • 1 x load, able to be slung and weighing approximately 0.3 tonne
Notes	<ul style="list-style-type: none"> • The machine selected for the test must be in serviceable condition and conform with current legislation • The operator's manual must be with the excavator • The incline must have at least an 18% (1:5.5) incline with sufficient manoeuvring room at the top, or a straight ramp with an up and down route with a flat area at the summit • The nominated area must be safe to allow excavations up to 2 metres deep • The load carrying vehicle must have a minimum capacity equivalent to 6 full (front) bucket loads of the excavator being used for the test • All lifting accessories must be fit for purpose and certificated • The weight of the load must be known • Manufacturer's data must be checked to ensure the machine is capable of lifting the specified load to the required radius • The slinger and signaller must be certificated and competent

ACTIVITY

Instructions

Sequence	<ul style="list-style-type: none"> Activity 1 must be undertaken at the start of the test Activities 2 and 4 to 7 can be undertaken at any time during the test Activity 9 must be undertaken at the end of the test <p>The test must be completed within a given time. The specifications' section gives further information.</p>
Preparing for work	1. Complete all manufacturers' pre-start and running checks and prepare the excavator for travel
Travelling & manoeuvring (refer to specifications)	2. Travel to the work area and: <ul style="list-style-type: none"> – travel up and down the slope – pass through a restriction in forward and reverse – travel over rough terrain
Setting up for work	3. Prepare and set the excavator for the relevant work
Working tasks (refer to specifications)	4. Produce 2 x straight trenches in a 'T' pattern with square starts and finishes 5. Load material into a vehicle 6. Change the (backhoe) bucket 7. Lift the load from minimum radius, position the load at 75% of full radius and rotate for 180 degrees. On completion land the load at a given point and detach 8. Reinststate the work area back to the original using all the function of the multi-purpose bucket
Shutting down	9. Park the excavator and carry out shut-down and securing procedures
Notes	<ul style="list-style-type: none"> For activity 5, at least four loads must be placed by the backhoe, which can be loaded whilst excavating the trenches. The remaining capacity to be loaded with the front loader using spoil from the stockpile The backhoe must be used for activity 7 If the machine is hot, checks unable to be carried out (i.e. coolant) may be assessed by the Tester using verbal questions

Activity measurements

Travel restrictions	<ul style="list-style-type: none"> 500 mm
Trenches depth	<ul style="list-style-type: none"> 0.8 metre ±35mm
Trenches lengths	<ul style="list-style-type: none"> 5 metres and 3 metres
Load movement	<ul style="list-style-type: none"> Maximum height of underside of the load = 1 metre
Load placing	<ul style="list-style-type: none"> 100 mm of a given position
Loading vehicle	<ul style="list-style-type: none"> Loaded to capacity
Test timings	<ul style="list-style-type: none"> The test must be completed within 2 hours and 45 minutes

Excavator 180

A10

Below 5 tonne

Technical Test – Practical

Basic details	Test ref.	Candidate name
	Tester name	Candidate ref.
	Tester ref.	Date of test
	Make and model	Start time of test
		Duration

MANDATORY		Correctly carried out during the test?	Y / N
Preparing	1 All pre-start and running checks (or responses to relevant questions)		
	2 Excavator set for travel		
Travelling	3 Restrictions cleared		
	4 Encountered hazards cleared		
	5 Travel direction on slopes		
	6 Full control maintained when travelling on slopes		
Setting up	7 Allocated area checked and clear of hazards prior to each activity		
	8 Excavator laterally level whilst excavating		
Working	9 Excavated material clear of trench		
	10 Trenches conformed to the stated sizes and tolerances		
	11 Full bucket loads when excavating (except for finishing work) and loading		
	12 Loading vehicle and excavator position prior to loading		
	13 Vehicle evenly loaded but not overloaded		
	14 Excavator stability maintained		
	15 Existing bucket removed and replacement bucket installed		
	16 Excavator position prior to lifting loads		
	17 SWL not exceeded at all times		
	18 Lifted, moved and lowered load in a controlled manner		
	19 Stability of the machine maintained at all times		
	20 Excavated area reinstated back to the original state		
	Shutdown	21 All shut down and securing procedures	
Other	22 Legislation, manufacturers' and health and safety requirements complied with		
	23 Test completed within the given time		
All of these items must be awarded		Achieved / Not achieved	

FAULTS		Candidate incorrectly carried out the following:		
		Fault	Mark	Penalty
Travelling	1 Excavator mounting and dismounting		1	
	2 Full observation before moving and reversing		2	
	3 Maintaining full observation whilst travelling and reversing		3	
	4 Matching travel speed to the ground type and conditions		1	
	5 Selecting appropriate gear ratios		1	
	6 Front loader low but clear of ground when travelling		2	
	7 Boom and dipper extension locked		2	
	8 Positioning and setting for excavating		2	
Working	9 Excavating trenches in layers		1	
	10 Sideswiping with the bucket		1	
	11 Edges of the excavations clean and clear		2	
	12 Placing material cleanly into the loading vehicle		1	
	13 Not using front loader below ground level when loading		2	
	14 Minimising contact with vehicle when loading		3	
	15 Load placing within given tolerances		2	
	16 Keeping load height within given tolerance		1	
	17 Smooth use of steering, hydraulic, braking and transmission controls		2	
Not exceeded 8 penalties		Total penalties		
				Achieved / Not achieved

