

# Level 2 Certificate in Golf Greenkeeping

## 0143-20/02

End-point Assessment – Knowledge Test

August 2019, v2

**Knowledge test 201**

Sample test and mark scheme

## Level 2 Golf Greenkeeping

### End-point Assessment – Knowledge Test

Assessment type	Combination of short answer and multiple choice questions, delivered online
Duration	2 hours
No of questions	39
Total marks available	84
Grading	P/M/D/X
Grade boundaries	Pass: 50/84 (60%) Merit: 59/84 (70%) Distinction: 67/84 (80%)

## Section 1 – Short answer questions

#	Question & Answer	Marks
1	State <b>one</b> benefit of greenkeepers carrying out Continuing Professional Development (CPD).	1
	Answer:	
2	State <b>two</b> ways to maintain effective working relationships in the workplace.	2
	Answer:	
3	a) State <b>one</b> hazardous and <b>one</b> non-hazardous type of waste that can arise when preparing the golf course.	2
	b) Describe <b>two</b> methods to minimise damage to the environment when dealing with waste.	2
	Answer:	
4	a) Identify <b>two</b> cultural methods for controlling turfgrass diseases.	2
	b) Describe how <b>each</b> method in 4a controls turfgrass diseases.	2
	Answer:	

5	List <b>three</b> steps to safely stop and leave a tractor after use.	3
Answer:		
6	Identify <b>three</b> benefits of scarifying golf greens.	3
Answer:		
7	State <b>three</b> types of aeration tine.	3
Answer:		
8	To remove thatch from golf greens, list a suitable: i. blade ii. depth iii. time of year	1 1 1
Answer:		
9	Name <b>three</b> methods of removing dew from golf greens prior to mowing.	3
Answer:		

10	List the <b>three</b> macronutrients of a balanced compound fertiliser for turfgrass growth.	3
Answer:		
11	<p>a) Name the process by which water is transferred from the soil and from growing turf into the atmosphere.</p> <p>b) Identify <b>three</b> factors that influence the loss of water from plant and evaporation from the soil.</p>	2 2
Answer:		
12	<p>a) Name <b>three</b> layouts for sub-soil piped drainage systems that are mainly installed on golf courses.</p> <p>b) Name an appropriate trench gradient (fall) for a corrugated-slotted pipe drainage system.</p>	3 1
Answer:		
13	State <b>three</b> identifiable features of anthracnose ( <i>Colletotrichum graminicola</i> ) disease in turfgrass.	3
Answer:		

14	State <b>three</b> damaging effects of broadleaf weeds in turfgrass surfaces for golf.	3
Answer:		
15	When preparing the soil for seeding grasses, name <b>four</b> factors that are required for successful establishment.	4
Answer:		
16	Name <b>four main</b> requirements for the photosynthesis process.	4
Answer:		
17	Identify the <b>four</b> parts of the grass plant labelled A to D. <div data-bbox="256 1352 831 2011" data-label="Image"> </div>	4

	Answer:	
<b>18</b>	State <b>four</b> methods to prepare ground for the establishment of turfgrass seed.	4
	Answer:	
<b>19</b>	<p>a) Name <b>one</b> piece of standard equipment to measure and compare putting green speeds.</p> <p>b) State <b>four</b> factors that can affect putting speeds on golf greens.</p>	5
	Answer:	

## Section 2 - Multiple choice questions

#	Question	Marks
20	Which is an employee's responsibility under the Health and Safety at Work Act (1974)? a) Maintain own health and safety at work only. b) Maintain colleagues' and their own health and safety only. c) Arranging their own and others' health and safety practices. d) Report work-related issues affecting safety to a supervisor.	1
21	Which is the <b>main</b> legislation relating to working safely on the golf course? a) The Management of Health and Safety at Work Regulations (1999). b) The Health and Safety (Offences) Act (2008). c) The Health and Safety at Work Act (1974). d) The Food and Environmental Protection Act (1985).	1
22	Which regulation covers assessing and working with harmful materials? a) Control of Substances Hazardous to Health Regulations (2002). b) Provision and Use of Work Equipment Regulations (1998). c) The Plant Protection Products (Sustainable Use) Regulations (2012). d) Control of Pesticides Regulations (1986).	1
23	What does ROPS stand for in relation to health and safety? a) Rolling Obstacle Protection System. b) Roles, Operatives, Personnel and Safeguarding. c) Rollover Protective Structure. d) Recycling Of Plastics and Sustainability.	1
24	Which one of the following statements is correct? a) All accidents at work must be reported according to Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013). b) All risk assessments must be reported according to Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013). c) All risk assessments must be documented. d) All accidents at work must be documented.	1
25	What does the term 'sustainability' mean, as used in golf course maintenance? a) The avoidance of the depletion of natural resources in order to maintain an ecological balance. b) The financial wellbeing of an organisation. c) That equipment of materials used on the golf course has a long life span. d) That pesticide is designed to have a long duration of effect on the target species.	1



26	<p>Which of the following is a hazardous waste?</p> <p>a) Cores from hollow tine work.</p> <p>b) 12V battery from an engine.</p> <p>c) Cardboard packaging of aerosol markers.</p> <p>d) Non-ferrous and ferrous metals.</p>	1
27	<p>What is the typical two-stroke fuel to oil ratio?</p> <p>a) 4:1.</p> <p>b) 25:1.</p> <p>c) 75:1.</p> <p>d) 100:1.</p>	1
28	<div data-bbox="263 728 502 862" data-label="Image"> </div> <p>What does this decal on machinery mean?</p> <p>a) Caution! Read journal first.</p> <p>b) Warning! The risk assessment is incomplete.</p> <p>c) Read the operator's manual.</p> <p>d) Think! Safety first.</p>	1
29	<p>Which one from the following is a typical hazard associated with operating a tractor with a trailed mower?</p> <p>a) Entanglement.</p> <p>b) Bio-hazardous materials.</p> <p>c) Falls from height.</p> <p>d) Slips, trips and falls.</p>	1
30	<p>Which pre-start check would <b>not</b> typically be carried out on a pedestrian-controlled mower?</p> <p>a) Tyre pressure.</p> <p>b) Oil level.</p> <p>c) Fuel level.</p> <p>d) Air filter.</p>	1
31	<p>Which is <b>not</b> a method to control thatch accumulation?</p> <p>a) Hollow tining.</p> <p>b) Rolling.</p> <p>c) Scarification.</p> <p>d) Top dressing.</p>	1

32	<p>Which environmental conditions would <b>best</b> suit solid tine aeration?</p> <p>a) No active grass growth and no surface moisture.</p> <p>b) No surface moisture and active grass growth.</p> <p>c) Moist surface conditions and active grass growth.</p> <p>d) No active grass growth and moist surface conditions.</p>	1
33	<p>Which of the following equipment is <b>not</b> used to work in top dressing?</p> <p>a) Switch cane.</p> <p>b) Springbok rake.</p> <p>c) Drag mat.</p> <p>d) True lute.</p>	1
34	<p>Which of the following describes dry patch?</p> <p>a) Dark green circular rings within the turf up to 2 m in diameter.</p> <p>b) Browning patches of turf which repel water.</p> <p>c) Thin, red, needle-like strands extending from the grass blade.</p> <p>d) Sunken circular patches with visible white mycelium.</p>	1
35	<p>Which renovation task would be <b>best</b> suited to repair an area of a thinning sward of 100 m<sup>2</sup>?</p> <p>a) Patching or plugging of the area.</p> <p>b) Apply 2,4D dicamba and seaweed to the area.</p> <p>c) Lightly roll the area and mow frequently.</p> <p>d) Aerate, overseed and top dress the area.</p>	1
36	<p>Which one of the following would be a suitable overseeding rate for bent grass (<i>Agrostis</i> spp.) on a golf green?</p> <p>a) 8 g/m<sup>2</sup>.</p> <p>b) 50 g/m<sup>2</sup>.</p> <p>c) 800 g/m<sup>2</sup>.</p> <p>d) 1000 g/m<sup>2</sup>.</p>	1
37	<p>Which characteristic is associated with red fescues (<i>Festuca rubra</i> spp.)?</p> <p>a) A weed grass of golf greens that seeds at a low height.</p> <p>b) A broadleaf grass when compared to bent grasses. (<i>Agrostis</i> spp.).</p> <p>c) Tufted annual with poor tolerance to drought conditions.</p> <p>d) Fine leaved grass with tufted and creeping species.</p>	1
38	<p>Which is a suitable soil pH for growing fine-leaved turfgrasses?</p> <p>a) 1.</p> <p>b) 3.</p> <p>c) 6.</p> <p>d) 9.</p>	1

<p><b>39</b></p>	<p>What is a suitable grass seed mix for a golf green?</p> <p>a) Perennial ryegrass and brown top bent grass (<i>Lolium perenne</i> and <i>Agrostis capillaris</i>).</p> <p>b) Chewings fescue and brown top bent grass (<i>Festuca rubra</i> subsp. <i>commutata</i> and <i>Agrostis capillaris</i>).</p> <p>c) Chewings fescue and perennial ryegrass (<i>Festuca rubra</i> subsp. <i>commutata</i> and <i>Lolium perenne</i>).</p> <p>d) Slender creeping red fescue and smooth stalked meadow grass (<i>Festuca rubra</i> subsp. <i>litoralis</i> and <i>Poa pratensis</i>).</p>	<p>1</p>
<p><b>40</b></p>	<p>Which turfgrass is <b>best</b> suited for tolerating a shaded site with low soil pH that is free-draining and nutrient poor?</p> <p>a) Slender creeping red fescue (<i>Festuca rubra</i> subsp <i>litoralis</i>).</p> <p>b) Perennial ryegrass (<i>Lolium perenne</i>).</p> <p>c) Velvet bent grass (<i>Agrostis canina</i> subsp. <i>canina</i>).</p> <p>d) Smooth-stalked meadow grass (<i>Poa pratensis</i>).</p>	<p>1</p>

## 0143-201 Knowledge Test - Mark Scheme



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## Section 1 – Short answer questions

#	Question & Answer	Marks
1	State <b>one</b> benefit of greenkeepers carrying out Continuing Professional Development (CPD).	1
	Any one of the following (or similar): <ul style="list-style-type: none"> <li>To increase current knowledge, skills and behaviours.</li> <li>To develop as a greenkeeper.</li> <li>To keep up to date with new legislation/practices.</li> </ul>	
2	State <b>two</b> ways to maintain effective working relationships in the workplace.	2
	Any two (or similar) of the following: <ul style="list-style-type: none"> <li>Clear and effective communication with others.</li> <li>Good teamwork.</li> <li>Be polite to colleagues.</li> </ul>	
3	a) State <b>one</b> hazardous and <b>one</b> non-hazardous type of waste that can arise when preparing the golf course.	2
	b) Describe <b>two</b> methods to minimise damage to the environment when dealing with waste.	2
	a) Examples may include, but are not limited to: <ul style="list-style-type: none"> <li>Hazardous waste – plant protection products/herbicides, inorganic fertilisers, marking paint aerosols, oils, batteries and washings from machinery.</li> <li>Non-hazardous – vegetation, soils, packaging (cardboard/pallets), waste from litter bins etc.</li> </ul>	
	b) Examples may include, but are not limited to: <ul style="list-style-type: none"> <li>Use of a specialist waste contractor to remove hazardous waste.</li> <li>Reduce the amount of hazardous wastes consumed, use non-hazardous alternatives.</li> <li>Recycle waste, i.e. hollow tine cores for constructions, separate waste for recycling collection and water recycling wash-down facility.</li> <li>Re-use waste such as organic waste for composting i.e. grass clippings, tree leaves</li> </ul>	
4	a) Identify <b>two</b> cultural methods for controlling turfgrass diseases.	2
	b) Describe how <b>each</b> method in 4a controls turfgrass diseases.	2
	a) The candidate should be able to name at least two (cultural) maintenance tasks, for example: aeration, brushing/switching, scarifying, resistant turf species/cultivars, diligent irrigation and fertiliser use; correct mower set-up (height and quality of cut) and adequate drainage. Essentially practices that work to dry and firm the surface. Apply nitrogen to reduce Red thread	

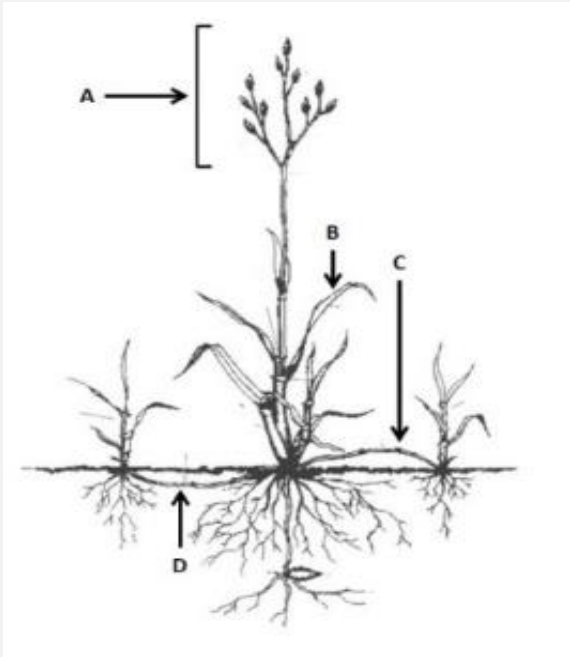
#	Question & Answer	Marks
	<p>b) <b>Aeration</b> – improves surface drainage and / or improves soil structure, in turn rooting and plant health to combat disease</p> <p><b>Brushing/switching</b> – Improves surface aeration, disperse moisture and dew from leaves.</p> <p><b>Scarifying</b> – To control and remove thatch material that can harbour disease/pathogenic fungi. Improve surface drainage and stimulate new growth (tillering) to grow out disease patches.</p> <p><b>Resistant turf species/cultivars</b> – Not necessarily name species/cultivars or describe the physiology how this happens, but highlight that there are species and cultivars that have improved disease resistance/competitive-ability amongst species and cultivars.</p> <p><b>Diligent irrigation</b> - Calculated watering to prevent over or under watering; or little and often watering; appropriate water quality (low salinity), correct irrigation system set-up i.e. nozzles and throw to prevent stress.</p> <p><b>Diligent fertiliser use</b> - may or may not include conditioners (bio-stimulants and plant growth regulators). Only calculated application to prevent deficiencies and disease. Modest applications of nitrogen only at appropriate times of year i.e. late spring to late summer. Use of organic fertilisers/bio-stimulants proven to reduce disease incidence.</p> <p><b>Correct mower set up</b> – A too low cutting height (i.e. below growing point of plant) or removing more than a third at each cut (scalping) can induce plant-stress, in turn leading to disease susceptibility. Blunt mowing blades (off-cut) can cause damage to the grass leaves with bruising, ripping etc. Damaged leaves can be more susceptible to turf disease on-set. Increased levels of Nitrogen will reduce Red Thread.</p>	
5	List <b>three</b> steps to safely stop and leave a tractor after use.	3
	<ul style="list-style-type: none"> <li>• Handbrake on</li> <li>• Stop engine with controls in neutral</li> <li>• Remove key.</li> </ul>	
6	Identify <b>three</b> benefits of scarifying golf greens.	3
	<p>Any three of the following or very similar:</p> <ul style="list-style-type: none"> <li>• control/remove thatch</li> <li>• control/remove moss</li> <li>• thin the sward</li> <li>• promote upright growth</li> <li>• increase putting seed</li> <li>• prepare for over-seeding</li> <li>• reduce broadleaf weeds</li> <li>• thin out flowering of annual meadow grass (<i>Poa annua</i>).</li> </ul>	

#	Question & Answer	Marks
7	State <b>three</b> types of aeration tine.	3
	<p>Any three of the following:</p> <ul style="list-style-type: none"> <li>• solid tine or pencil tine or star tine</li> <li>• slit tine or knife tine</li> <li>• hollow tine* (or *core is acceptable) or spoon</li> <li>• chisel or root pruning tine.</li> </ul> <p><b>Note:</b> Each of the above are types of tine. Where 'or' is used it denotes the types are interchangeable terms and cannot be used to identify different types. For example, an answer that includes solid tine, pencil tine and star tine would equal one point from the possible three.</p> <p>Similarly, the size of the tine cannot be defined as a different type. For example, hollow tine and micro-hollow tine are the same type of tine. As is a 13mm solid tine and a 19mm solid tine.</p>	
8	To remove thatch from golf greens, list a suitable:	
	<p>i. blade</p> <p>ii. depth</p> <p>iii. time of year</p>	<p>1</p> <p>1</p> <p>1</p>
	<p>i. <b>Blades</b> – Scarifying, Thatch removal or control blades (or an answer very similar i.e. Thatch-Away)</p> <p>ii. <b>Depth</b> – “minus 5 to minus 20 mm” below surface, also accept -to depth of existing thatch layer</p> <p>iii. <b>Time of year</b> – spring and/or autumn</p>	
9	Name <b>three</b> methods to remove dew from golf greens prior to mowing.	3
	<ul style="list-style-type: none"> <li>• Switching</li> <li>• Blower</li> <li>• Brushing</li> <li>• Preventative use of wetting agent (accept wetting agent/surfactant/wetter)</li> </ul> <p>May also accept - Applying irrigation immediately beforehand</p>	
10	List the <b>three</b> macronutrients of a balanced compound fertiliser for turfgrass growth.	3
	<ul style="list-style-type: none"> <li>• Nitrogen (N)</li> <li>• Phosphorus (P)</li> <li>• Potassium (K)</li> </ul> <p>Magnesium (Mg) is also accepted.</p> <p><b>Note:</b> Also accept- N, P, K and Mg</p>	

#	Question & Answer	Marks
11	a) Name the process by which water is transferred from the soil and from growing turf into the atmosphere.	2
	b) Identify <b>three</b> factors that influence the loss of water from plant and evaporation from the soil.	2
	<p>a) Evapotranspiration</p> <p><b>Note:</b> (may or may not include the acronym = ET, however acronym only is not accepted).</p> <p>b) Any three of the following factors:</p> <ul style="list-style-type: none"> <li>• temperature</li> <li>• wind speed</li> <li>• light duration (daylight duration or limitation of exposure, such as shade)</li> <li>• turf sward density (based on density influences evaporation rates)</li> <li>• atmospheric air pressure</li> <li>• soil moisture (tension or volumetric)</li> <li>• grass species</li> </ul>	
12	a) Name <b>three</b> layouts for sub-soil piped drainage systems that are mainly installed on golf courses.	3
	b) Name an appropriate trench gradient (fall) for a corrugated-slotted pipe drainage system.	1
	<p>a) May include any of the following three: herringbone, grid, catch water drain, French drain, fan, natural layout or random layout.</p> <p>b) Any one of the following are acceptable: 1:50, 1:100 or 1:200</p> <p><b>Note:</b> A range between gradient 1:50 to 1:200 is accepted</p>	
13	State <b>three</b> identifiable features of anthracnose ( <i>Colletotrichum graminicola</i> ) disease in turfgrass.	3
	<p>Any three of the following or very similar:</p> <ul style="list-style-type: none"> <li>• yellowing of leaf blades</li> <li>• blackening or rotting of the basal or crown</li> <li>• black pin cushion type structures on leaf</li> <li>• Infects small patches of turf up to 150 mm in diameter.</li> <li>• infected plants are easily picked from the sward</li> <li>• predominantly infects annual meadow-grass (UK)</li> <li>• infects areas of compacted soil conditions or prolonged wet surfaces</li> <li>• infects areas of low soil nitrogen availability.</li> </ul>	



#	Question & Answer	Marks
14	<p>State <b>three</b> damaging effects of broadleaf weeds in turfgrass surfaces for golf.</p> <p>Any three of the following or very similar:</p> <ul style="list-style-type: none"> <li>• impair the playing surface performance i.e. irregular roll, reduce ball roll/distance (speed), uneven firmness of surface</li> <li>• aesthetics – irregular texture of surface appearance.</li> <li>• thinning and weakening of sward i.e. susceptible to wear.</li> <li>• compete with grasses for light</li> <li>• compete with grasses for soil nutrients</li> <li>• compete with grasses for soil moisture.</li> </ul>	3
15	<p>When preparing the soil for seeding grasses, name <b>four</b> factors that are required for successful establishment.</p> <ul style="list-style-type: none"> <li>• Correct tilth – fine</li> <li>• Correct consolidation – firm, but not hard (take a pressed in heel)</li> <li>• soil pH – 5.5 to 6.5</li> <li>• Good ground/soil conditions – adequate drainage, free from stones, weeds, litter, debris (<b>NB:</b> multiple ground conditions are equal to 1 mark)</li> <li>• Appropriate soil temperature</li> <li>• Appropriate soil moisture</li> </ul> <p><b>Reference to:</b> soil nutrients, and/or an appropriately named soil texture type (e.g. sand/soil root zone, loamy soil etc.) may also be accepted in exchange for any of the above.</p>	4
16	<p>Name <b>four main</b> requirements for the photosynthesis process.</p> <ul style="list-style-type: none"> <li>• Carbon dioxide</li> <li>• Water</li> <li>• Sunlight</li> <li>• Chlorophyll</li> </ul> <p>May also accept 'Temperature' in exchange of any of the above</p>	4

#	Question & Answer	Marks
17	<p>Identify the <b>four</b> parts of the grass plant labelled A to D.</p> 	4
	<p>A. Inflorescence or seed head or flower head  B. Leaf blade (leaf is acceptable)  C. Stolon  D. Rhizome</p>	
18	<p>State <b>four</b> methods to prepare ground for the establishment of turfgrass seed.</p> <p>Any four of the following or very similar:</p> <ul style="list-style-type: none"> <li>• Clearance of vegetation</li> <li>• Cultivation</li> <li>• Raking</li> <li>• Heeling/Consolidation</li> <li>• Treading</li> <li>• Applying pre-seeding fertiliser</li> </ul> <p><b>Note:</b> Rolling is also acceptable</p>	4
19	<p>a) Name <b>one</b> piece of standard equipment to measure and compare putting green speeds.</p> <p>b) State <b>four</b> factors that can affect putting speeds on golf greens.</p>	1 4
	<p>a) Stimpmeter.</p> <p>b) Grass type, height of cut, firmness of surface, moisture content, frequency and type of rolling, double cutting, thatch levels, density of sward coverage, verti-cutting / grooming / scarifying, previous applications of top-dressing may also be considered correct.</p>	

## Section 2 - Multiple choice questions

#	Correct Answer	Marks
20	D. Report work-related issues affecting safety to a supervisor.	1
21	C. The Health and Safety at Work Act (1974).	1
22	A. Control of Substances Hazardous to Health Regulations (2002).	1
23	C. Rollover Protective Structure.	1
24	D. All accidents at work must be documented.	1
25	A. The avoidance of the depletion of natural resources in order to maintain an ecological balance.	1
26	B. 12V battery from an engine.	1
27	B. 25:1.	1
28	C. Read the operator's manual.	1
29	D. Slips, trips and falls.	1
30	A. Tyre pressure.	1
31	B. Rolling	1
32	C. Moist surface conditions and active grass growth.	1
33	B. Springbok rake.	1
34	B. Browning patches of turf which repel water.	1
35	D. Aerate, overseed and top dress the area.	1
36	A. 8 g/m <sup>2</sup> .	1
37	D. Fine leaved grass with tufted and creeping species.	1
38	C. 6.	1
39	B. Chewings fescue and brown top bent grass ( <i>Festuca rubra</i> subsp. <i>commutata</i> and <i>Agrostis capillaris</i> ).	1
40	A. Slender creeping red fescue ( <i>Festuca rubra</i> subsp. <i>litoralis</i> ).	1