

Soil Exam Questions Higher

2013

- (d) Classify the following rock types:
 - (i) quartzite
 - (ii) shale
 - (iii) basalt.

2012

- Compare limestone and granite as parent materials in soil formation.

- (a) The National Ploughing Association of Ireland often holds its ploughing championships on brown earth soils.
- (i) Suggest **two** reasons why such soils are suited to tillage.
 - (ii) Draw a large labelled diagram of a brown earth soil profile.
- (b) Explain how a **named** soil texture influences
- (i) pore spaces,
 - (ii) water movement,
 - (iii) fertility.
- (c) Describe a laboratory experiment to show the effect of phosphate deficiency in a plant.

Describe a laboratory **or** field method to demonstrate cation exchange in a soil.

2011

- List **three** practices that would increase the population of earthworms in farmland.
- Describe how you would identify limestone as a parent material in a soil.

- (a)
 - (i) Name **one** type of soil pan.
 - (ii) Outline how the named soil pan is formed.
 - (iii) State **one** problem associated with the named soil pan.
 - (iv) Say how the named soil pan could be removed.

- (b)
 - (i) Describe gleisation **and** its role in the development of a soil profile.
 - (ii) Explain the factors to be considered when collecting soil samples for analysis.

- (c) Describe an experiment to investigate the presence of nitrogen in a soil sample.

- Describe a laboratory or field experiment to demonstrate soil flocculation

- Highlight the main differences between drainage and irrigation

2010

- State the purpose of a soil-auger

- (a) List four factors that are responsible for the development of soil structure.
- (b) Outline the formation of peat bogs in Ireland.
- (c) Describe an experiment to estimate the percentage organic matter in a soil sample.

- Describe a laboratory **or** field method to determine the texture of a sample of wet soil.

- Describe a laboratory **or** field method to determine the number of earthworms in a pasture.

2009

- Give **three** reasons for low earthworm populations in certain soil conditions.
- Name **three** minerals present in igneous rocks.

- (a)
 - (i) Outline in reasonable detail why care should be taken in removing soil samples from a field before testing the soil fertility levels.
 - (ii) What is meant by the term *lime requirement*?
 - (iii) List the elements found in ground limestone.

- (b)
 - (i) Explain *cation exchange*.
 - (ii) Explain the term *cation exchange capacity* (CEC).
 - (iii) Mention a soil type where CEC is very low.
 - (iv) Describe a method by which CEC may be increased in a soil.

- (c) Describe a laboratory experiment to test a soil for the presence of phosphates.

2008

- Draw a labelled diagram to show the main features of a podzol soil.

- (a) Explain how the weathering of rocks contributes to soil formation.
- (b) (i) Explain the following terms as used in the context of plant growth in soil;
1. field capacity,
 2. permanent wilting point,
 3. available water.
- (ii) The following table shows the water content of three soil samples.
1. What is the percentage of available water in sample A?
 2. Which sample would be the most suitable for a crop suffering a drought during the growing season?
 3. Which sample would be the most suitable for a crop growing during a wet spring?

Soil sample	% Water at Field Capacity	% Water at Wilting Point
A	6	2
B	24	12
C	30	22

- (c) Describe an experiment to compare the capillarity of two contrasting soils.

- Give a scientific explanation for the improvement of a soil by the addition of lime.

2007

- Explain why colloidal humus particles are more beneficial than colloidal clay particles in a soil.

- List **three** characteristics of a loam soil that would make it suitable for tillage.

- (a)
 - (i) State **two** differences in composition between soil air and atmospheric air.
 - (ii) Explain how any **one** of the differences you have mentioned occurs.

- (b) Describe an experiment which compares the movement of water by capillarity within two contrasting soils.

- (c) Explain how each of the following influences the temperature of a soil:
 - (i) aspect,
 - (ii) colour,
 - (iii) water content,
 - (iv) location.

- Describe a laboratory or field experiment in relation to the effect of structure formation on total pore space in soils.

2006

- Explain why most soils in Ireland are regarded as “young” soils in geological terms.
- State **three** reasons why texture is an important soil property.

- (a) Explain why regular liming of land is an important farming operation in Ireland.
- (b) List the main steps in the podzolisation of a soil.
- (c) Outline the chemical exchanges that would occur in the soil between the lime, soil colloids and soil solution following the application of lime.
- (d) Describe the influence of earthworm activity on the structure and development of a soil.

- Describe a laboratory or field method to show the presence of a **named** mineral nutrient in a soil sample.

2005

- (i) Name the type of sedimentary rock that is prevalent in the Burren, County Clare.
- (ii) Describe a chemical process that aids in weathering of this rock.
- (iii) Name **one** feature of a soil formed from this type of rock.

- (a) Explain how each of the following farm operations could affect the population of earthworms in a tillage field:
- (i) Soil cultivations,
 - (ii) Spreading farmyard manure.
- (b) Give **three** differences between a soil developed under coniferous forest and a soil developed under grassland.
- (c)
- (i) What is cation exchange?
 - (ii) Describe a laboratory experiment that would demonstrate the phenomenon of cation exchange in a soil.

- Compare a sandy soil and a clay soil under the following headings; capillarity, fertility, texture.

2004

- List **four** characteristics of a loam soil in comparison to a clay soil.

- (a) The following table shows the analysis of two soils A and B.

	Coarse Sand	Fine Sand	Silt	Clay
Soil A	46%	20%	20%	14%
Soil B	10%	17%	28%	45%

- (i) Identify the texture of soil A and soil B.
- (ii) Explain how these two soils differ under the headings of physical properties and chemical properties.
- (b) Using a labelled diagram, describe any **named** soil profile.
- (c) Explain how soils are influenced during their formation by the following factors:
- (i) Parent material
 - (ii) Climate
 - (iii) Topography
 - (iv) Living organisms.

- Describe a laboratory or field method to show the presence of a **named** major element in a soil sample.

2003

- Explain **three** characteristics of a loam soil that make it very suitable for tillage crops.

- Explain how the aspect of a field affects the temperature of a soil in early spring.

- (a) Explain how flocculation contributes to the development of the structure within a soil.
- (b) Cementation and separation are two processes that affect the development of soil structure.
- (1) Explain the underlined terms.
 - (2) State and explain **four** factors that contribute to these two processes.
- (c) Describe with the aid of labelled diagrams, an experiment to investigate the structure and texture of any named soil type.

- Describe a laboratory or field method to show how the activities of earthworms have an important role in the soil

2002

- Explain each of the following terms:
- (1) Soil biomass
- (2) Soil humus

- Give **one** example of a sedimentary rock and state **one** location for this rock in Ireland.