



The Open University of Sri Lanka  
Faculty of Engineering Technology  
Industrial Studies (Agriculture) Programme of Study  
Final Examination 2015/2016  
AEI3235 – Land & Soil Tillage Management

00059

Date : 15/11/2016  
Time : 09.30 a.m. – 12.30 p.m.  
Duration : Three (03) hours

Registration Number:.....

**Section 02 – Answer any four (04) out of the six (06) questions. You may use answer books and/or sheets to answer this section.**

- 1) a) A trapezoidal depression exists along the width of a road, and it needs to be leveled. The depth of the depression is 40 cm. Lengths at the opening and the bottom of the trapezoidal depression are 1 m and 60 cm, respectively. The width of the road is 2 m. Calculate the volume of soil needed to fill the depression.  
b) Explain how the tripod and the automatic level are leveled prior to using in a levelling survey.
- 2) a) Explain the terms, “Soil Bulk Strength” and “Soil Clod Strength”.  
b) Using sketches, explain how clod strength and bulk strength in soil vary with the soil moisture content.
- 3) a) Discuss the indirect and direct impacts of soil compaction.  
b) Explain different methods of identifying soil compaction.  
c) Compare particle density and bulk densities in a compacted and a non-compacted soil.
- 4) A land leveling survey is conducted to determine heights along a land, which has the following points: A, B, C, D, E, and F. The automatic level is placed between Points A and B. The staff is placed at each point, and the respective back sight (BS), intermediate sight (IS), and fore sight (FS) readings are obtained. BS reading when the staff is at Point A is 1.118 m, and the IS readings for Points B and C are 0.347 m, and 1.662 m. FS reading for Point D is 2.582 m.  
a) Considering Point A, which is situated 200.0 m above mean sea level, as the bench mark, calculate the heights at Points B, C, and D.  
b) The automatic level is placed between Points D and E, and the BS reading when the staff is at D is taken. Also, IS readings for Points E and F are taken, which are 1.020 m and 0.442 m, respectively. Calculate the heights at Points E and F.

- 5) a) State how an A-Frame is used in identifying contour lines along a road.  
b) "Contour lines in a land are not intersected". Do you agree or not? Briefly explain the reasoning for the answer.
- 6) a) Discuss how acid sulphate soils are formed in coastal areas.  
b) Explain biophysical indicators that can be used in identifying acidic waterways.