# ELIZADE UNIVERSITY
*Pragmatic Innovation for Development*

## FACULTY: ENGINEERING
## DEPARTMENT: CIVIL ENGINEERING
## FIRST SEMESTER EXAMINATION (MARCH 2017)
## 2016/2017 ACADEMIC SESSION

**Course Title: Engineering Surveying and Photogrammetry II**

**Course Code: CVE 413**

| HOD'S SIGNATURE |
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**Instructions:**

1) Answer questions 1, 2 and any other two

2) Time Allowed: 2.5 hours

3) SEVERE PENALTIES APPLY FOR MISCONDUCT, CHEATING, POSSESSION OF UNAUTHORIZED MATERIALS DURING EXAM

# ELIZADE UNIVERSITY
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Elizade University, Ilara-Mokin
Department of Civil and Environmental Engineering.
First Semester 2016/2017 Examination
CVE 413: Engineering Surveying and Photogrammetry II

Instruction: **Answer questions 1, 2 and any other two**
Time allowed: 2hrs 30 minutes

## Question 1(30 marks).

(a)    Give the definition of the following:

    (i)    Contour.    (ii) Contour line        (iii) Contour interval

    (iv)        Contour Horizontal   Equivalent        (v) Scale of a map (**5 marks**)

(b)    Itemize the factors for deciding contour interval and explain two of them(**8 marks**)

(c)    State the characteristics of contour lines (**5 marks**).

(d)    List and briefly describe the methods of contouring (**7 marks**)

(e)    Determine a contour interval on a map on a scale 1:50,000. (**5 marks**)


## Question 2(30 marks)

(a)    Define Area and state the units of area that are commonly used (**4 marks**)

(b)    Itemize the methods used in calculating areas of portions of land (**4 marks**)

(c)    Study Figure Q2. Carefully and use the figure to calculate the following:

(i)    the area of the portion using Trapezoidal method and confirm the area  using Simpson's method(**6 marks**)

(ii)    the volume taking the average of the mean of the width as  6.42 m (**6 marks**)

(iii)    the volume using cross-sections A, B, C, D and E. (**6 marks**)

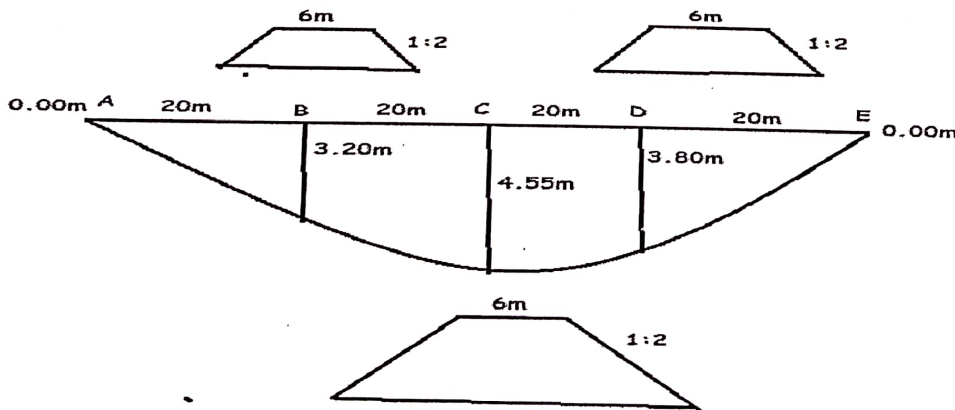(d)    Compare your answers in (ii) and (iii). (**4 marks**)



Figure Q2: Longitudinal and Cross-sections of a section of road in a valley.

## Question 3(20 marks)

(a) Differentiate between Trapezoidal, Simpson and average ordinate Methods. (3 marks)

(b) List four formulae that can be used for calculating the area of geometrical figures (4 marks).

(c) Calculate the area of a triangle with sides 64.7 m, 85.2 m and 101.7 m and the area of a trapezium with 4.3 m and 6.1 m as the parallel sides and 2.1 m as the perpendicular distance between the parallel sides(6 marks).

(d) The following perpendicular offsets were taken at 10 m intervals from a survey line AB to an irregular boundary line 2.30, 3.80, 4.55, 6.75, 5.25, 7.30, 8.95, and 5.50 metres. Calculate the area in $m^2$ enclosed between the survey line, the irregular boundary, the first and the last offsets using the average ordinate method(7 marks).

## Question 4 (20 marks)

(a) Itemize the types of projects where the earthwork volumes are of paramount importance (4 marks).

(b) State three methods by which earthwork volume may be computed (3 marks).

(c) Figure Q4 is a level section in a cut along a road section where: b is the formation or subgrade width, h is the centre of cut, d1, d2 are the sides width of half breadth and h1, h2 are the depth of cuttings at the edge points of cut, and S:1 is the side slope. Show that the area of the cut section is h(b+sh) (4 marks)..

(d) If b=10.3m, S=2, h=1.5m and there are five sections of equal area along this road with 20m as chainage between each section.
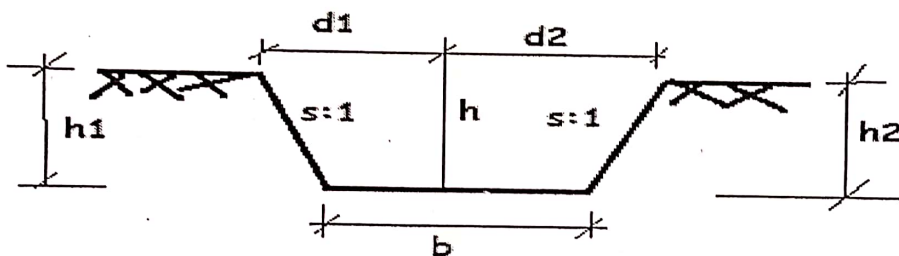


Figure Q4: Level Section in Cut.

Compute:

(i) the area of the sections and(4 marks).

(ii) the volume of the section in cut using Trapezoidal method(5 marks).

## Question 5 (20 marks)

(a) Briefly describe the relationship between surveying and setting out of works (4 marks).

(b) List the two methods of setting out of buildings (4 marks).

(c) Succinctly describe how to set out a rectangular building of length 15 m and breadth 8m (external dimensions) using 3, 4, 5 method and using tri- square. State how to check the correctness of what you have just done (8 marks)..

(d) What is the usefulness of profile boards in setting out operation? (4 marks).