JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

UNIVERSITY EXAMINATIONS   2012/13 ACADEMIC YEAR

SECOND YEAR FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN CONSTRUCTION MANAGEMENT

COURSE CODE: TCM 3217   TITLE: ENGINEERING SURVEY 1

DATE: ...../8/2013   DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES

This paper consists of 5 questions

Answer question ONE and any other two questions

QUESTION ONE (MARKS 30)

i.   Define what you understand by the term engineering survey (MARK 2)
ii.   Surveying can be broadly classified into three categories. List the three considerations under which the classifications are based (MARKS 3)
iii.   Based on the considerations you have mentioned in (v) above, mention two types /categories of survey which fall under each (MARKS 3)
iv.   List any four types of measurements which one may use either singly or in a combination to fix a relative position of a point on , below or above the earth's surface by use of survey (MARKS 4)
v.   List any five objectives which may be the origin of a survey activity (MARKS 5)
vi.   Mention any three basic methods used in survey for horizontal linear measurements (MARKS 3)
vii.   Surveying chain and measuring tape are two basic survey equipment used in horizontal linear measurement. Outline any advantages and disadvantages of each as concerns their suitability for the purpose (MARKS 6)
viii.   Mention any four qualities of a good surveyor (MARKS 4)

QUESTION TWO (MARKS 20)

Four main principles of survey were discussed in class during the lecture sessions
i.   Mention the four principles of survey as discussed in class (MARKS 6)
ii.   Mention the importance of these of principles to the surveying profession (MARKS 4)
iii.   Briefly discuss each of the four principles mentioned above (MARKS 10)

QUESTION THREE (MARKS 20)

All methods of survey involve measurements of angles and distances in the horizontal and vertical planes. The locations of points in these planes are determined by applying various trigonometric and geometrical processes to the measured quantities
i.   List the three basic methods of fixing a point on a horizontal plane (MARKS 3)
ii.   Briefly describe each of the methods listed in (i) above making use of diagrams also to illustrate your answer

QUESTION FOUR (MARKS 20)

i.   List three methods of determining elevation in a vertical plane (MARKS 3)
ii.   Describe briefly how each of the three methods mentioned in (i) above is used (MARKS 12)
iii.   In a practical exercise to determine the elevation of a point marked B, students undertaking a course in Building and Civil Engineering at JOOUST obtained the following data using ordinary spirit levelling method
- Elevation of Bench Mark (BM) = 98.321 m asl
- Staff reading on BM = 2.684 m
- Staff reading on point B = 0.924 m

Determine the elevation of point B (MARKS 5)

QUESTION FIVE (MARKS 20)

In a field practical exercise, students of JOOUST undertaking a course in Construction Management obtained the data given in the table below. The work started at a Bench Mark on a culvert near the gate and was closed on a Bench Mark near the sewerage treatment works. The position of the instrument was changed along the way whenever necessary as the work proceeded.

Staff reading	Remarks	
1.289	On Bench Mark with reduced level 110.941 m asl	
0.488	Reading on intermediate station	
0.853	Reading on intermediate station	
0.448	Forward reading on first change point	
2.829	Back reading on first change point	
2.012	Reading on intermediate station	
0.945	Reading on intermediate station	
0.756	Reading on intermediate station	
0.994	Forward reading on second change point	
1.670	Back reading on second change point	
2.652	Reading on intermediate station	
0.640	Reading on intermediate station	
3.152	Reading on last station	
2.371	Reading on nearby Bench Mark, RL =112.912 m asl	

a) Using any of the two common booking methods, enter the data and compute the reduced levels of all the stations
b) Carry out check on the arithmetic work
c) Compute closing error if any