

**KERALA AGRICULTURAL UNIVERSITY**  
**B.Sc.(Hons.) Agriculture – 2010 Admission - 1<sup>st</sup> Semester**  
**Final Examination – March/April 2011**

Cat. No. : Engg 1101  
Title : Fundamentals of Soil Water and  
Conservation Engineering (1+1)

Max. marks: 80  
Time : 3 hours

**I. State True or False: (10 x 1 = 10)**

1. In plane surveying, the curvature of earth is taken into account.
2. The fundamental principle of surveying is to work from the part to the whole.
3. In the first quadrant, the latitude and departure of a traverse line are positive.
4. The magnetic declination at a place is constant.
5. Direct ranging is possible only when the end stations are inter-visible.
6. In a well conditioned triangle, all angles should be  $30^{\circ}$  or more.
7. When the actual length is less than the measured length, the error is negative.
8. The bearings observed with a prismatic compass are quadrantal bearings
9. The instrument used for setting up an offset at right angle, is called open cross staff.
10. The contour lines cross the valley or ridge lines at  $90^{\circ}$  degree.

**II. Answers on ANY TEN (10 x 3 = 30)**

1. The whole circle bearing of lines AB and AC are  $120^{\circ}$  and  $40^{\circ}$ , respectively. Determine the included angle CAB.
2. Explain the terms used in chain surveying such as base line, check line and tie line.
3. A square shaped one hectare area is to be surveyed with 30 m chain. What will be the measured area by this chain, if it is found to be 10 cm too short?
4. Mention various types of gully control structures for soil conservation.
5. What is local attraction? Explain the procedure to correct it.
6. Explain the method of water measurement using a Cipoletti weir.
7. Compute the discharge through a  $90^{\circ}$  V-notch under the effective head of 1 meter.

8. What is end-contraction for a weir during water measurement, and how to deal with it?
9. Determine the discharge capacity of a channel having trapezoidal cross section with 1 m base width, 1:1 side slopes and 1 m depth of flow, laid on the grade of 1 m in 100 m. The Manning's roughness coefficient for the surface is 0.05.
10. Explain the working of a Parshall-flume for measurement of irrigation water.
11. Compute the discharge through a circular orifice with 7 cm diameter under the effective head of 1 meter.
12. Mention all the important characteristics of contour lines.

**III. Attempt ANY SIX of the following**

**(6 x 5 = 30)**

1. Explain the detailed procedure of setting up the plane table over a station.
2. Explain the functions of different instruments used for plane table survey of a field.
3. Two sprinkler lines of 105 m length each at 18 m spacing having 11 sprinklers at 10 m interval on each line. Determine the capacity of a sprinkler system to irrigate the field at the rate of 1 cm per hour.
4. Briefly explain various temporary structures for gully control.
5. Briefly explain various surface irrigation methods along with their merits and demerits.
6. Explain various methods of computing the enclosed area of a traverse.
7. Mention various advantages and disadvantages of drip irrigation system.
8. Explain various components of a sprinkler irrigation system.

**IV. Answer ANY ONE**

**(10 x 1 = 10)**

1. What is chain surveying? Explain the methods of chain surveying along with the materials used for the same. Also mention various possible obstacles during chain surveying.
2. What is leveling? Draw neat sketch of Dumpy level with labeled parts and explain the procedure of working with a Dumpy level.