B.E. (Civil) Part II 3rd Semester Final Examination, 2012
Subject: Surveying (CE 301)

Time: 3 Hours   Full Marks: 70

Use separate answer-script for each half.
The figure within the bracket indicates full marks.
Two (2) marks are reserved for neatness in each half.
Answer <u>THREE (3)</u> questions from each half.

FIRST HALF

1. (a) Draw a typical network system for conventional control survey.

   (b) In a central triangular ABC(O), the angles are AL=AR=29°, BL=BR=31°, CL=CR=30°, AOB=BOC=COA=120°. Check the geometrical conditions.

   (11)

2.   Explain in brief
       (a) Reference ellipsoid
       (b) Various projection systems

   (11)

3.   Write short notes on
       (a) GPS
       (b) Satellite
       (c) Geocentric coordinate

   (11)

4. (a) Where vertical curves are used?

   (b) For a simple circular curve, radius 329 m, intersection angle is 48°. Make charts of y (offset from tangent) for x = 0, 11, 41, 71 and 4 offsets from long chord for chain intervals at 30 m each.

   (11)

5. (a) Show a typical mass-haul diagram.

   (b) The earth cuttings in a proposed road are of depths 3, 2.7, 2.0, 1.5 and 0.0 m. The width is 5 m throughout. Calculate 5 sectional areas and volume of earthwork by any standard method, if the length is 4x30 m.

   (11)

6. (a) What causes errors in measurements? What are the different types of errors?
   (b) Distinguish between accuracy and precision.
   (c) Why weights to the measurements are important in field observations?
   (d) The following are six equally reliable and direct measurements of a base line in meter.
   702.0; 701.4; 701.8; 701.6; 701.5 and 701.9.
   Calculate the most probable value and its probable error.

   (4+2+2+3=11)

7. (a) How leveling is done using theodolite (vertical angle) and trigonometry?
   (b) Lengths of a pentagonal traverse are AB=CD=98 m, BC=99 m, DE=EA=97 m. The bearings are AB=0°, BC=288°, CD=216°30′, DE=145°, EA=72°30′. Calculate closing error.

   (3+8=11)

8. What is meant by plane tabling? When do you recommend it? What are the accessories required in a plane table survey? How do you orient the table in plane table survey? Also describe one of the methods briefly.

   (1+1+2+2+5=11)

9. (a) Explain the principles of electronic distance measurement.
   (b) Name different components of total station.
   (c) State different applications of total station in engineering works.
   (d) Discuss the procedure for angle and distance measurement by total station.

   (4+2+2+3=11)

10. (a) Explain the effects of curvature and refraction in leveling.
   (b) An observer standing on the deck of a ship just sees a lighthouse. The top of the light house is 30 m above mean sea level and the height of the observer's eye is 5 m above mean sea level. Find the distance of the observer from the light house.
   (c) Explain how the procedure of reciprocal leveling eliminates the effect of refraction and curvature as well as the error of collimation?

   (3+3+5=11)