TCE-403

Roll No. to be filled in your Answer Book

Roll No.

PAPER ID-

B.Tech.
Civil Engineering,IV
Advanced Surveying (TCE-403)

Time- 3 Hours   **Max marks: 100**

NOTE:
i.   All questions are compulsory.
ii.   Draw diagrams wherever necessary.
iii.   All questions carry equal marks.

1. Attempt any **FOUR** parts of the following.   5 X 4

(A)   Write down the different methods for baseline measurement in details along with the list of base measuring equipment.

(B)   Explain the method of intersection and resection for finding the location of pointsin the context of the survey.

(C)   Describe the term "phase of a signal" with neat diagram. How one can ignore or minimise its impact on the measurement.

(D)   What is a well-conditioned triangle in triangulation? Derive the expression for the well-conditioned triangle.

(E)   Define the following terms:

i)   Hour angle   ii) Zenith and Nadir

(F) A vertical photograph was taken at an altitude of 980 meters above mean sea level. Determine the scale of the photograph for a terrain lying at elevations of 95 meters and 300 meters if the focal length of the camera is 14.5 cm.

2. Attempt any **FOUR** parts of the following   5 X 4

   (A)   Explain the following, along with a neat sketch:

            i) Forward tangent ii) Apex distance

   (B)   What is the basic principle of remote sensing? Discuss active and passiveremote sensing.

   (C)   What is the baseline? How is it selected? Describe the procedure of itsextension.

   (D)   What is remote sensing? Describeenergy interaction with the atmosphere and earth surface features.

   (E)   Discuss image interpretationtechniques of remote sensing.

   (F)   What is the principle of E.D.M.? Discuss electromagnetic waves andthe electromagnetic spectrum.

3. Attempt any **TWO** parts of the following   10X2

   (A)   The elevation of points A, B and C are 100, 110 and 125 m. The distance AB is 6 km, and that of BC is 8 km. Will B obstruct the line of sight from A to C. What will be the height of the signal required at C?

   (B)   What is the principle of position fixing in GPS? Write down the factors affecting GPS observations along with their effect on accuracy.

   (C)   Mention the advantages of Total station over convention survey methods and also discuss the working principle of the same.

4. Attempt any **TWO** parts of the following   10X2

   (A)   In a triangulation survey, the altitudes of two stations A and B, 110 km apart,are respectively 440 m and 725 m. The elevation of a peak P situated 65 km from A has anelevation of 410 m. Ascertain if A and B are inter-visible, and if necessary, find by how much Bshould be raised so that the line of sight nowhere be less than 3 m above the surface of the ground.Take earth's mean radius as 6400 km and the mean coefficient of refraction as 0.07.

(B)   A satellite station S was occupied, during triangulation, at 62.18m from the station A. The following observations were recorded at the satellite station:

Bearing   Length

A= 296°12'2"   AB= 10864 m

B= 71°54'32"   AC= 8041 m

C = 0°0'00".

Calculate the angle CAB.

(C)   Two tangents intersect at chainage 1000 meters. The deflection angle being 28 degrees, calculate the necessary data to set out a simple circular curve of the 200-meter radius by Rankine's method of deflection angles. Take interval as 10 meters.

5.   Attempt any **TWO** parts of the following   10 X 2

(A)   Directions were observed from a satellite station 80m from R, with the following results: P (0°0'00") Q (72°54'32") and R (298°18'00"). The approximate lengths of PR and QR are 18 km and 23.76 km. Calculate the angle subtended at station R.

(B)   What is a satellite station in the survey? Derive the expression for reduction to the centre for satellite station.

(C)   Define the term NAVSTAR GPS along with its advantageous. Explain the relative and differential positioning of GPS.

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