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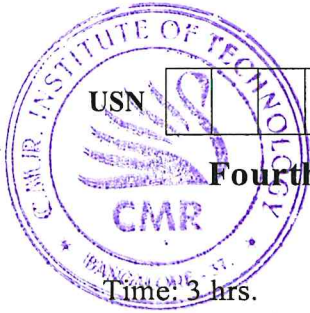
17CV46

Fourth Semester B.E. Degree Examination, July/August 2022
Advanced Surveying

Time: 3 hrs.   Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With the help of a neat sketch of a simple circular curve, explain
   (i) Intersection angle   (ii) Point curve
   (iii) Length of long chord   (iv) Forward tangent
   (v) Vertex distance   (vi) Summit distance   **(06 Marks)**

   b. Define degree of a curve. List any three parameters involved in curve setting. **(04 Marks)**

   c. Two tangents intersect at chainage 1250m, the IA = 150° (Intersection angle). Calculate all the necessary data for setting out a curve of radius 250m by deflection angle method. Take peg interval = 20m. Least count of theodolite = 20″.   **(10 Marks)**

OR

2 a. What is transition curve? List the function and essential requirements of an ideal transition curve.   **(06 Marks)**

   b. Two straight BA&AC are intersected by a line EF. The angle BEF and EFC are 130° and 140°. The radius of first arc is 500 m and the second arc is 300m. Find the chainages of tangent points and point of compound curvature given that chainage of the intersection point "A" is 3200m.   **(08 Marks)**

   c. Two parallel railway lines are to be connected by a reverse curve, each section having the same radius. If the lines are 12m apart and the maximum distance between tangent points measured parallel to the straight is 48m, find the maximum allowable radius. Calculate the chainage of point of reverse curvature and point of tangency, if the chainage of T_1 = 912m.
   (06 Marks)

Module-2

3 a. List the various factors that are to be considered in the selection of site for baseline and station in triangulation survey.   **(06 Marks)**

   b. Explain orders of triangulation.   **(06 Marks)**

   c. From a satellite station 'S' which is 14m "A" angles measured to three triangulations stations are as follows:

   $\lfloor$CSA = 32° 45′ 48″ $\lfloor$BSC = 68° 26′ 36″

   The length of sides, AC and BC are 5678m and 1441m respectively. Find the angle of BAC.
   (08 Marks)

OR

4 a. Explain laws of weights.   **(08 Marks)**

   b. Explain kinds and sources of errors.   **(04 Marks)**

   c. Find the most probable value of the angles A and B from the following equations.
   A = 40° 15′ 21.4″   B = 45° 12′ 18.4″
   A + B = 85° 27′ 45.2″   **(08 Marks)**

Module-3

5 a. Define the following terms:
   (i) Zenith   (ii) Nadir   (iii) The sensible horizon
   (iv) The altitude   (v) Celestial sphere.   (05 Marks)
   b. Show that one nautical mile is equal to 1.852 km.   (05 Marks)
   c. Find the shortest distance between two points A and B, given :
       A Latitude – 18° 24′ N   Longitude 36° 18′ E
       B Latitude – 68° 32′ N   Longitude 126° 34′ E   (10 Marks)

OR

6 a. Briefly explain the solution of spherical triangle by Napier's rule of circular parts. (06 Marks)
   b. Explain Ecliptic and Solstices.   (06 Marks)
   c. Find the GMT corresponding to following LMT:
       (i) 9 hour 10 minutes 12 second AM at a place in Longitude 42° 36′ W
       (ii) 4 hour 32 minutes 10 second AM at a place in Longitude 56° 32′ E   (08 Marks)

Module-4

7 a. Define the following terms:
   (i) Vertical photograph   (ii) Flying height   (iii) Perspective projection
   (iv) Exposure station.   (06 Marks)
   b. Derive an expression for relief displacement on a vertical photograph.   (06 Marks)
   c. Find the number of photographs (size 250 × 250 mm) required to cover a area of 20km × 16km of the longitudinal overlap is 60% and the side overlap is 30% scale of the photograph is 1 cm = 150 m.   (08 Marks)

OR

8 a. Derive the relation for the scale of a vertical photograph.   (06 Marks)
   b. List the reasons for keeping overlap in photographs.   (06 Marks)
   c. A vertical photograph was taken at a altitude of 1200m above mean sea level. Determine the scale of the photograph for a terrain lying at elevations of 80m and 300m, if the focal length of the camera is 15cm.   (08 Marks)

Module-5

9 a. Mention the advantages of Total station and also discuss the working principles of the same.   (08 Marks)
   b. What are the advantages of LIDAR Technology?   (04 Marks)
   c. Explain the stages of idealized remote sensing system.   (08 Marks)

OR

10 a. What is GIS? Explain the components of GIS.   (10 Marks)
   b. Explain the basic principles of GPS and it's application in surveying.   (10 Marks)

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