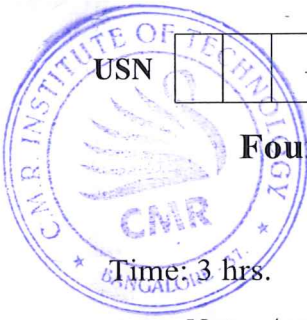USN | | | | | | | | | |

15CV46

Fourth Semester B.E. Degree Examination, June/July 2019
Advanced Surveying

Time: 3 hrs.

Max. Marks: 80

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

Module-1

1   a. Derive relationship between Radius and Degree of the curve. Draw Reverse curve for parallel straights and label the parts. **(08 Marks)**

   b. Two tangents intersect at chainage of 59 + 60, the deflection angle being 50°30′. Calculate the necessary data for setting out a curve of 300 m radius to connect the two tangents by the offset from chords produced method with peg interval of 20 m. The chain is of 20 m length. **(08 Marks)**

OR

2   a. Give the requirement of transition curves on highways and why are vertical curves provided on highways? **(08 Marks)**

   b. A Road bend deflects 80° and is to be designed for a maximum speed 100 kmph and centrifugal ration = 1/4. The maximum rate of change of acceleration = 30 cm/cubic.sec. The curve consists of a circular are combined with two spirals. Calculate the radius of the circular curve, length of the transition curve, total length of the combined curve, chainages of beginning and end of transition curve and junction of transition curves with circular curve? Chainage of point of intersection = 42862 m. **(08 Marks)**

Module-2

3   a. Briefly discuss on the classification of triangulation system with figures. **(08 Marks)**

   b. Directions are observed from eccentric station S at 62.18m from station C. The following were the results $\hat{A} = 0°0′0″$, $\hat{B} = 21°54′32″$, $\hat{C} = 296°12′2″$, AC = 8240.6 m, BC = 10863.6m, obtain the angle $A\hat{C}B$? **(08 Marks)**

OR

4   a. What are probable errors, most probable value and normal equations? What is spherical excess? **(08 Marks)**

   b. The following are the observation data:

   $\hat{A} = 45°30′10″$ of weight 2

   $\hat{B} = 40°20′20″$ of weight 3

   $\hat{A} + \hat{B} = 85°50′10″$ of weight 1

   Find most probable values of $\hat{A}$ and $\hat{B}$? **(08 Marks)**

Module-3

5   a. With sketches define the following:
   i) Declination of star and hour angle
   ii) Altitude of star and Azimuth **(08 Marks)**

   b. Determine the azimuth and altitude of a star from the following data. Latitude of the observer = 48°, Hour angle of the star = 43 degrees, Declination of star = 18°20′ N. **(08 Marks)**

OR

6 a. What is Astronomical triangle? State the Napier's rule for solving the astronomical triangle?
(08 Marks)

b. A star has a declination of 50°15′, its upper culmination is in the Zenith of the place. Find the altitude of the star at lower culmination. **(08 Marks)**

Module-4

7 a. State the different applications of photogrammetry. Derive equation for relief displacement in vertical aerial photograph. **(08 Marks)**

b. Two points A and B having elevations of 500 m and 300 m respectively above the datum appear in vertical photograph of focal length = 20 cms and flying height of the aircraft = 2500 m above the datum, their corrected coordinates are as follows:

Point	Photographic Coordinates	
	x (cms)	y (cms)
a	+2.65	+1.36
b	−1.92	+3.65

Determine the length of AB? **(08 Marks)**

OR

8 a. Briefly discuss on the procedure for carrying out the aerial survey to acquire the pictures of the specified area. **(08 Marks)**

b. The scale of the aerial photo is 1 cm = 100 m, the size of photo = 20cms × 20 cms. Determine number of photographs required to cover an area of 100 km^2 for the specified overlaps. **(08 Marks)**

Module-5

9 a. How is distance measurement carried out using EDM? **(05 Marks)**

b. Write a note on image interpretation technique. **(05 Marks)**

c. Briefly bring out the process on differential positioning in GPS. **(06 Marks)**

OR

10 a. Explain the components of GIS. **(08 Marks)**

b. What are the applications of total station? **(04 Marks)**

c. Briefly discuss on the different applications of GIS in civil engineering. **(04 Marks)**

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