CBCS SCHEME

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15CV46

Fourth Semester B.E. Degree Examination, July/August 2021
Advanced Surveying

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions.***

1 a. With the help of a neat sketch differentiate between Apex distance and Mid ordinate. Also derive their expressions. **(06 Marks)**

b. The first branch of a reverse curve has a radius of 200 m. Find the radius of second branch, so that the curve can connect parallel straights 18 m apart. The distance between tangent points is to be 110 m. Also calculate the lengths of two branches of the curve. **(10 Marks)**

2 a. What is a transition curve? List the conditions to be fulfilled by a transition curve. **(06 Marks)**

b. Tabulate the necessary data to set out a right handed simple circular curve in the field having a radius of 250 m, connecting two straights which deflects at an angle of 30° at chainage 1250 m by Rankine's method. Take Peg interval of 20 m and least count of the instrument as 20″. **(10 Marks)**

3 a. What is meant by reduction to centre? Derive an expression for reducing the angles measured at the satellite station to the main station (any one case). **(08 Marks)**

b. Find the most probable values of the angles A and B from the following observations at a station 'O'.

$A = 49°48'36.6''$ weight 2

$B = 54°37'48.3''$ weight 3

$A + B = 104°26'28.5''$ weight 4 **(08 Marks)**

4 a. Enumerate the various laws of weights. **(07 Marks)**

b. The following are mean values observed in the measurement of three angles α, β and γ at one station.

$\alpha = 76°42'46.2''$ with weight 4.

$\alpha + \beta = 134°36'32.6''$ with weight 3

$\beta + \gamma = 185°35'24.8''$ with weight 2

$\alpha + \beta + \gamma = 262°18'10.4''$ with weight 1

Calculate the most probable value of each angle. **(09 Marks)**

5 a. Explain the following terms:

(i) Celestial sphere.
(ii) Zenith and Nadir.
(iii) Latitude and co-latitude.
(iv) Azimuth and Declination. **(08 Marks)**

b. Determine the Azimuth and Altitude of a star from the following data:

(i) Declination of star = 20°30′ N
(ii) Hour angle of star = 42°6′
(iii) Latitude of the observer = 50°N **(08 Marks)**

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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6 a. Enumerate the various celestial co-ordinate systems. Explain Altitude and Azimuth system. **(08 Marks)**

b. Find the shortest distance between two places A and B, given that the longitudes of A and B are 15°0′ N and 12°6′N and their longitudes are 50°12′E and 54°0′E respectively. Radius of earth = 6370 km. **(08 Marks)**

7 a. Explain the following terms :
(i) Tilted photograph.
(ii) Scale of a vertical photograph.
(iii) Stereoscope.
(iv) Flying height and Flight line. **(08 Marks)**

b. A vertical photograph was taken at an altitude of 1200 m above mean sea level. Determine the scale of the photograph for terrain lying at elevations of 80 meters and 300 metres if the focal length of the camera is 15 cm. Also find representative fraction. **(08 Marks)**

8 a. Write an explanatory note on overlaps and mosaics. **(06 Marks)**

b. Derive the expression for Relief Displacement on a vertical photograph. **(06 Marks)**

c. The scale of an aerial photograph is 1 cm = 100 m. The photograph size is $20\text{cm} \times 20\text{cm}$. Determine the number of photographs required to cover an area of $8\text{km} \times 12.5\text{km}$, if the longitudinal lap is 60 % and the side lap is 30%. **(04 Marks)**

9 a. Explain electromagnetic spectrum. State the wave length regions, along with their uses, for remote sensing applications. **(08 Marks)**

b. What do you understand by remote sensing? Differentiate between active and passive remote sensing. **(08 Marks)**

10 a. What is GIS? Enumerate the techniques used in GIS. What are the advantages of GIS? **(08 Marks)**

b. What is LIDAR? List out its components. Briefly outline its benefits. **(08 Marks)**

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