CBCS SCHEME

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17CV46

Fourth Semester B.E. Degree Examination, June/July 2023
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. List the different methods of setting out simple circular curves. Explain the angular method of setting out simple circular curve by Rankine's method of refection angles. **(10 Marks)**

b. Two tangents intersect at chainage 1192.0 mt. The deflection angle being 50°30′. Calculate the necessary data for setting out a curve of 300 mt radius by Rankine's method of deflection angles. Take peg interval equal to 20 mts. **(10 Marks)**

OR

2 a. With a neat sketch, list any four vertical curves. **(04 Marks)**

b. A compound curve consisting of two arcs of radius 350 m and 550 m connects two straights AB and BC which are intersected by a line PQ. The angles APQ and BQP are 139°30′ and 36°24′ respectively. Determine the chainages of the tangent points if the chainage of the intersection point B is 5425.191 mt. **(08 Marks)**

c. The first branch of reverse curve has a radius of 200 m. Find the radius of second branch so that the curve can connect parallel straights 18m part time distance between tangent points is to be 110 m. Also calculate the length of two branch of the curve. **(08 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. Write a note on classification of triangulation system. **(06 Marks)**

c. From a satellite station S, 5.8m from main triangulation station A, the following directions were observed:

A	0°	0′	0″
B	132°	18′	30″
C	232°	24′	6″
D	296°	6′	11″

The lengths of AB, AC and AD were computed to be 3265.5m, 4022.2m and 3086.4m respectively. Determine the directions of AB, AC and AD. **(08 Marks)**

OR

4 a. State and explain laws of weights. **(08 Marks)**

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

$\alpha = 76° 42' 46''$ .2 with weight 4

$\alpha + \beta = 134° 36' 31''$ .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. **(12 Marks)**

Module-3

5 a. Define the following terms:
   i) The Celestial sphere
   ii) The azimuth
   iii) The hour angle
   iv) The prime vertical **(08 Marks)**

b. Find the G.M.T corresponding to the following LMT:
   i) 9h 10m 12s A.M at a place in longitude 42°30′W
   ii) 4h 32m 10s A.M at a place in longitude 56°32′E **(12 Marks)**

OR

6 a. Define the following terms:
   (i) The visible horizon
   (ii) Vertical circle
   (iii) The sensible horizon
   (iv) The Altitude **(08 Marks)**

b. The standard time meredian in India is 82°30′E. If the standard time at any instant is 20 hours 24 minutes 6 seconds, find the local mean time for two places having longitudes 20°E and 20°W. **(12 Marks)**

Module-4

7 a. Define the following terms:
   i) Vertical photograph
   ii) Oblique photograph
   iii) Tilted photograph **(06 Marks)**

b. List the reasons for keeping overlap in photographs. **(06 Marks)**

c. A vertical photograph was taken at an altitude of 1200 meters above MSL. Determine the scale of the photograph for terrain lying at elevations of 80 m and 300 m if the focal length of the camera is 15cm. **(08 Marks)**

OR

8 a. Explain the procedure for aerial survey. **(06 Marks)**

b. Derive the expression for relief displacement on a vertical photograph. **(08 Marks)**

c. Find the number of photographs (250 × 250 mm) required to cover over a area of 20 km × 16 km, the longitudinal overlap is 60% and the side overlap is 30%. Scale of the photograph is 1 cm = 150 m. **(06 Marks)**

Module-5

9 a. With neat sketch, explain the electromagnetic spectrum. **(06 Marks)**

b. Define remote sensing. Explain the stages of idealized remote sensing system. **(08 Marks)**

c. Explain the components of GIS. **(06 Marks)**

OR

10 a. What are the advantages of LIDAR technology? **(04 Marks)**

b. Mention the advantages of total station and also discuss the working principle of same. **(08 Marks)**

c. What is GPS? Explain the basic principles of GPS and its applications in surveying. **(08 Marks)**

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