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17CV46

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

Time: 3 hrs.

Max. Marks: 100

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

1.
  - a. Define degree of curve. Establish the relation between degree of curve and its radius. (05 Marks)
  - b. Two tangents AB and BC intersect at point B at chainage 150.50m calculate all the necessary data for setting out a circular curve of radius 100m and deflection angle  $30^\circ$  by the method of offsets from the long chord. (10 Marks)
  - c. Define the following terms:
    - i) Horizontal curve
    - ii) Compound curve
    - iii) Reverse curve
    - iv) Vertical curve
    - v) Transition curve. (05 Marks)
  
2.
  - a. List the different methods of setting out simple circular curve. Explain the linear method of setting out simple curve by the method of offsets from chord produced. (10 Marks)
  - b. Two tangents intersect at chainage 1250m. The angle of intersection is  $150^\circ$  calculate all data necessary for setting out a curve of radius 250m by the deflection angle method. The peg intervals may be taken as 20m. Least count of the vernier is  $20''$ . Calculate the data for field checking. (10 Marks)
  
3.
  - a. What are the important factors to be considered in selection of site for base line? (05 Marks)
  - b. State and explain laws of weights. (10 Marks)
  - c. Explain three kinds of errors. (05 Marks)
  
4.
  - a. Explain classification of Triangulation system. (10 Marks)
  - b. Give the classification of signals. Explain them with neat sketch. (10 Marks)
  
5.
  - a. Define the following terms:
    - i) Celestial sphere
    - ii) Hour angle
    - iii) Prime vertical
    - iv) Sensible horizon
    - v) Latitude of place. (05 Marks)
  - b. Find the shortest distance between two places A and B given that the latitude of A and B are  $15^\circ 0' N$  and  $12^\circ 6' N$  and their magnitude are  $50^\circ 12' E$  and  $54^\circ 0' E$  respectively. Find also the direction of B on the great circle route radius of earth = 6370km. (10 Marks)
  - c. Mention the properties of spherical triangle. (05 Marks)
  
6.
  - a. Briefly explain the solution of spherical triangle by Napier's rule of circular points. (05 Marks)
  - b. Explain with neat sketches coordinate systems. (15 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.

- 7 a. Explain Terrestrial photogrammetry with basic principle with neat sketch and their types. (10 Marks)
- b. Define the following terms:  
 i) Camera axis ii) Focal length iii) Focal plane iv) Print v) Film base. (05 Marks)
- c. Explain Horizontal and vertical angles from Terrestrial photograph. (05 Marks)

- 8 a. Explain Phototheodolite. (05 Marks)
- b. Three points A, B and C were photographed and their coordinates with respect to the line joining the collimation marks on the photograph are

Point	x	y
a	-35.52mm	+21.43mm
b	+8.48mm	-16.38mm
c	+48.26mm	+36.72mm

The focal length of the lens is 120.80mm. Determine the Azimuths of the lines OB and OC if that of OA is  $354^{\circ} 34'$ . The axis of the camera was level at the time of the exposure at the station O. (10 Marks)

- c. Explain Aerial camera with neat sketch. (05 Marks)
- 9 a. What are the properties of Electromagnetic waves? (05 Marks)
- b. Explain types of EDM instruments. (10 Marks)
- c. Briefly explain fundamental measurements of total station. (05 Marks)
- 10 a. Explain with neat sketch Idealized remote sensing system. (10 Marks)
- b. What are the applications of GIS in civil engineering? (05 Marks)
- c. Explain global positioning system. (05 Marks)

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