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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° 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° 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)

- 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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