

# CBCS SCHEME



15CV46

## Fourth Semester B.E. Degree Examination, Aug./Sept. 2020 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. With a neat sketch, derive an expression for following elements of a simple curve:  
(i) Mid-ordinate (ii) External distance (iii) Long chord (06 Marks)
- b. Calculate the ordinates at 10 m distances for a circular curve having a long chord 80 m and a versed size of 4 m. (10 Marks)

OR

- 2 a. List any four requirements of a transition curve. (04 Marks)
- b. What are vertical curves and why are they used? (04 Marks)
- c. Two straight lines with a total deflection angle of  $72^{\circ}30'$  are to be connected by a compound curve of branches of equal length. The radius of the first arc is 350 m and that of the second arc is 500 m. The chainage of the vertex is 1525 m. Find the chainages of two tangent points and point of compound curvature. (08 Marks)

### Module-2

- 3 a. List the criteria for selecting site for a triangulation station. (04 Marks)
- b. Explain the concept of reduction to centre. (04 Marks)
- c. What is a well conditioned triangle? Show that the bare angle for the best shaped triangle is  $56^{\circ}14'$ . (08 Marks)

OR

- 4 a. Explain : (i) Independent and dependent quantities. (04 Marks)  
(ii) Direct and indirect observation. (04 Marks)
- b. Explain the three kinds of errors in measurements. (04 Marks)
- c. Find the most probable values of angles M and N from following observations at station A.  
 $M = 9^{\circ}48'36.6''$  weight 2  
 $N = 54^{\circ}37'48.3''$  weight 3  
 $M + N = 104^{\circ}26'28.5''$  weight 4 (08 Marks)

### Module-3

- 5 a. Define the following terms :  
(i) Zenith and Nadir.  
(ii) Celestial sphere.  
(iii) Spherical triangle.  
(iv) Celestial Horizon. (08 Marks)
- b. Find the shortest distance between two places A and B in kilometers, given that the latitudes of A & B are  $15^{\circ}0' N$  and  $12^{\circ}6' N$  and their longitudes are  $50^{\circ}12' E$  and  $54^{\circ}0' E$  respectively. Radius of Earth is 6370 km. (08 Marks)

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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.

OR

- 6 a. Explain Napier's rule of circular parts. (08 Marks)  
 b. What are the coordinate systems for specifying the position of a celestial body? Explain in brief. (08 Marks)

Module-4

- 7 a. List any six applications of aerial photogrammetry. (06 Marks)  
 b. Explain the following terms:  
 (i) Flying height (ii) Exposure station (iii) Vertical photograph  
 (iv) Tilted photograph (v) Oblique photograph (10 Marks)

OR

- 8 a. Explain in detail step by step procedure of aerial surveying. (08 Marks)  
 b. Derive an expression for scale of a vertical photograph. (08 Marks)

Module-5

- 9 a. Explain the working principle of total station. Also explain the three fundamental measurements in a total station. (08 Marks)  
 b. Define remote sensing and list its applications in different fields. (08 Marks)

OR

- 10 a. Write a note on EDM instruments. (04 Marks)  
 b. Explain the application of integrating remote sensing and GIS. (12 Marks)

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