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## 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 cuves and why are they used?       **(04 Marks)**
   c. Two straight lines with a total deflection angle of 72° 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°14′.       **(08 Marks)**

**OR**

**4**  a. Explain : (i) Independent and dependent quantities.
               (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°48′36.6″       weight 2
   N = 54°37′48.3″       weight 3
   M + N = 104°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°0′ N and 12°6′ N and their longitudes are 50°12′ E and 54°0′ E respectively. Radius of Earth is 6370 km.       **(08 Marks)**

**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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