

## CBCS Scheme

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15CV46

**Fourth Semester B.E. Degree Examination, June/July 2017**  
**Advanced Surveying**

Time: 3 hrs.

Max. Marks: 80

**Note: Answer FIVE full questions, choosing one full question from each module.**

Module-1

- 1 a. Explain the following along with a neat sketch : (08 Marks)  
 i) Forward tangent ii) Point of curve iii) Deflection angle iv) Apex distance.  
 b. Two tangents intersect at a chainage of 1190m, the deflection angle  $36^\circ$ . Compute all the data necessary to set out a curve of radius 300m by deflection angle method. The peg interval is 30m. Tabulate the results. (08 Marks)

OR

- 2 a. A reverse curve is to be set out to connect two parallel railway line 30m apart. The distance between the tangent points is 150m. Both the arcs have the same radius. The curve is set out by method of ordinates from long chord taking a peg interval of 10m. Calculate the necessary data for setting the curve. (08 Marks)  
 b. List the requirements of a transition curve (any four). (04 Marks)  
 c. With a neat sketch, list any four vertical curves. (04 Marks)

Module-2

- 3 a. Mention the points to be considered in the selection of triangular station. (06 Marks)  
 b. Triangulation station B was used in measuring angles and the instrument was necessary to shift to a satellite station S due south of main station B at a distance of 12.2m from it. The line BS bisects the exterior angle A, B, C and the angles ASB and BSC were observed to be  $30^\circ 20' 30''$  and  $29^\circ 45' 6''$ . When the station B was observed angles CAB and ACB were observed to be  $59^\circ 18' 26''$  and  $60^\circ 26' 12''$ . The side AC computed to be 4248.5m from the adjacent triangle. Determine the correct value of the angle ABC. (10 Marks)

OR

- 4 a. Explain the three kinds of errors. (03 Marks)  
 b. The observed values of P, Q and R at a station the angles being subjected to the condition that  $P + Q = R$ .  
 $P = 30^\circ 12' 28.2''$  ;  $Q = 35^\circ 48' 12.6''$  ;  $R = 66^\circ 0' 44.4''$  (08 Marks)  
 Find the most probable value of P, Q and R.  
 c. Explain the probability curve. (05 Marks)

Module-3

- 5 a. Define the following terms : (03 Marks)  
 i) Zenith and Nadir ii) Prime vertical iii) Hour angle.  
 b. Mention the properties of a spherical triangle. (05 Marks)  
 c. Find the shortest distance between two points A & B, given  
 A latitude –  $18^\circ 24' N$  longitude  $36^\circ 18' E$   
 B latitude –  $68^\circ 32' N$  longitude  $126^\circ 34' E$ . (08 Marks)

OR

1 of 2

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.

15CV46

- 6 a. Define the following : i) Vertical circle ii) Azimuth iii) Altitude. (03 Marks)  
b. Explain Ecliptic and Solstices. (05 Marks)  
c. Find the shortest distance between two places A & B given that the longitudes of A and B are  $15^{\circ} 0' N$  and  $12^{\circ} 6' N$  and longitudes are  $50^{\circ} 12' E$  and  $54^{\circ} 0' E$  respectively. (08 Marks)

**Module-4**

- 7 a. Define the following terminologies :  
i) Exposure station ii) Picture plane iii) Perspective centre. (03 Marks)  
b. Mention the general features of Photographic images. (07 Marks)  
c. Find the number of photographs (size  $250 \times 250\text{mm}$ ) required to cover over a area of  $20\text{km} \times 16\text{km}$  of the longitudinal overlap is 60% and the side overlap is 30% scale the photograph is  $1\text{cm} = 150\text{m}$ . (06 Marks)

OR

- 8 a. Derive an expression for relief displacement on a vertical photograph. (05 Marks)  
b. Explain the procedure for aerial survey. (05 Marks)  
c. A vertical photograph was taken at a altitude of 1200 meters above mean sea level. Determine the scale of the photograph for a terrain lying at elevations of 80 meters and 300 meters if the focal length of the camera is 15cm. (06 Marks)

**Module-5**

- 9 a. Mention the advantages of total station and also discuss the working principles of the same. (08 Marks)  
b. Define Remote sensing. Explain the stages of idealized remote sensing system. (08 Marks)
- OR
- 10 a. What is GIS? Enumerate on GIS applications in civil engineering. (08 Marks)  
b. Explain the basic principles of GPS and its application in surveying. (08 Marks)

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