



CBCS SCHEME

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17CV46

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021 Advanced Surveying

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. List the different methods of setting out simple circular curves. Explain the angular method of setting out simple circular curve by Rankine's method of deflection angles. (10 Marks)
- b. Two tangents intersect at a chainage 1000mt, the deflection angle being 28° . Calculate the necessary data to set out a simple circular curve of 200mt radius by Rankine's method of deflection angles. Take per interval as 10mt. (10 Marks)

OR

- 2 a. What is a transition curve? List the functions and essential requirements of an ideal transition curve. (06 Marks)
- b. Two straight with a total deflection angle of 72° are to be connected by a compound curve of two branches of equal length. The Radius of the first branch is 300mt and that of the second branch is 400mt, chainage at intersection point is 1500mt. Calculate the chainages of tangent points and that of Point of Compound Curvature (PCC). (08 Marks)
- c. Two parallel railway lines are to be connected by a reverse curve of different radii. If the lines are 10mt apart and maximum distance between tangent points measured parallel to the straight is 45mt, calculate the Radius of the second branch if that at first branch is 65mt, calculate the length at both the branches. (06 Marks)

Module-2

- 3 a. List the various factors, that are to be considered in the selection at site for base line and stations in triangulation survey. (06 Marks)
- b. Write a note on classification of triangulation system. (06 Marks)
- c. From an eccentric station S, 12.25mt to the west of the main station B, the following angles were measured

$$\angle BSC = 76^\circ 25' 32'' \quad \angle CSA = 54^\circ 32' 20''$$

The stations S and C are to the opposite sides at the line AB, calculate the correct angle ABC, if the lengths AB and BC are 5286.5 and 4932.2m respectively. (08 Marks)

OR

- 4 a. State and explain laws of weights. (08 Marks)
- b. The following are the mean values observed in the measurement of three angles α , β and γ at one station.
 $\alpha = 76^\circ 42' 46''.2$ with weight 4
 $\alpha + \beta = 134^\circ 36' 32''.6$ with weight 3
 $\beta + \gamma = 185^\circ 35' 24''.8$ with weight 2
 $\alpha + \beta + \gamma = 262^\circ 18' 10''.4$ with weight 1
Calculate the most probable value of each angle. (12 Marks)

Module-3

- 5 a. Define the following terms:
- The Celestial sphere
 - The azimuth
 - The sensible horizon
 - The hour angle.
- (08 Marks)
- b. Find the G.M.T corresponding to the following LMT:
- 9h 10m 12s A.M at a place in longitude $42^{\circ}36'W$
 - 4h 32m 10s A.M, at a place in longitude $56^{\circ}32'E$
- (12 Marks)

OR

- 6 a. Define the following terms:
- Zenith and Wadir
 - The visible horizon
 - The prime vertical
 - The hour angle
- (08 Marks)
- b. The standard time meridian in India is $82^{\circ}30'E$. If the standard time at any instant is 20 hours 24 minutes 6 seconds, find the local mean time for two places having longitudes
- $20^{\circ}E$
 - $20^{\circ}W$.
- (12 Marks)

Module-4

- 7 a. Define the following terms:
- Vertical photograph
 - Flying height
 - Perspective projecting
 - Exposure station
- (08 Marks)
- b. A vertical photograph was taken at an altitude of 1200 meters above mean sea level. Determine the scale of the photograph for terrain lying at elevations of 80meters and 300meter if the focal length of the camera is 15cm.
- (12 Marks)

OR

- 8 a. List the reasons for keeping overlap in photographs. (08 Marks)
- b. Describe how mosaic differs from a map. (06 Marks)
- c. A section line AB appears to be 10.16cm on a photograph for which the focal length is 16cm. The corresponding line measures 2.54cm on a map which is to a scale 1/50,000. The terrain has an average elevation of 200m above mean sea level. Calculate the flying altitude at the aircraft, above mean sea level, when the photograph was taken. (06 Marks)

Module-5

- 9 a. Define Remote sensing. List the applications in Civil Engineering. (10 Marks)
- b. What is GIS? With a neat sketch, explain the components of GIS. (10 Marks)

OR

- 10 a. What is GPS? Explain the basic principles of GPS and its application in surveying. (10 Marks)
- b. Explain the working principle of total stations and list the salient features of total station. (10 Marks)

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