



Fourth Semester B.E. Degree Examination, Jan./Feb. 2023
Advanced Surveying

Max. Marks: 80

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

Module-1

- 1 a. What are the elements of a simple curve? With standard notations write down the formulae connecting them. (06 Marks)
- b. Two tangents intersect at chainage of 1200m, the deflection angle being 40° . Calculate the data required to set out a simple curve by Rankine's method. Radius of the curve is 200m and the normal chord length is 20m. (10 Marks)

OR

- 2 a. What is a Transition Curve? List the functions and conditions to be fulfilled by a transition curve. (08 Marks)
- b. A compound railway curve ABC is to have the radius of arc AB 400m and that of BC, 500m. The intersection point is V, and the deflection angle is 44° . If the arc AB is to have a length of 200m, calculate the chainages of tangent points, if the chainage of intersection point is 1450m. (08 Marks)

Module-2

- 3 a. Explain the importance of reconnaissance in a triangulation survey. (08 Marks)
- b. From a satellite station S, 5.8m from the main triangulation station A, the following directions were observed.
A – $0^\circ 0' 0''$
B – $132^\circ 18' 30''$
C – $232^\circ 24' 06''$
D – $296^\circ 06' 11''$
The lengths AB, AC and AD were computed to be 3265.5m, 4022.2m and 3086.4m respectively. Determine the directions of AB, AC and AD. (08 Marks)

OR

- 4 a. Define the terms :
i) Probable error
ii) Average error
iii) Weight of an observation. (06 Marks)
- b. In measuring the angles P, Q, R and S at a station which closes the horizon, the readings are:
 $\angle P = 100^\circ 30' 22''$ weight 1
 $\angle Q = 82^\circ 40' 10''$ weight 2
 $\angle R = 90^\circ 20' 08''$ weight 3
 $\angle S = 88^\circ 26' 25''$ weight 4
Adjust the angles P, Q, R, S. (10 Marks)

Module-3

- 5 a. Explain the following terms :
 i) Equation of time
 ii) Celestial sphere
 iii) Solastices
 iv) Sidereal time. (08 Marks)
- b. Find the shortest distance between two places A and B, given that the latitudes of A and 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. Find also the direction of B on the great circle route. Radius of earth = 6370Km. (08 Marks)

OR

- 6 a. List the methods for determining the latitude of a place. (08 Marks)
- b. Find the GMT corresponding to the following LMT.
 i) 9h 40m 12s at a place in longitude $42^{\circ} 36'W$
 ii) 4h 32m 10s at a place in longitude $56^{\circ} 32'E$. (08 Marks)

Module-4

- 7 a. Compare Aerial photographs and TOPO maps. (08 Marks)
- b. 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 of the aircraft, above mean sea level, when the photograph was taken. (08 Marks)

OR

- 8 a. Explain about Mosaics and list their uses. (08 Marks)
- b. An area $30\text{km} \times 24\text{km}$ is to be photographed with a camera having 30cm focal length. The photograph size is $20\text{cm} \times 20\text{cm}$. Average scale of the photograph is to be 1 : 12,000, effective at an elevation of 400m above datum. Aircraft speed is 200km/hr. Longitudinal overlap is to 60% and side lap is to be 30%. Calculate :
 i) Flying height at aircraft above datum
 ii) Number of flight lines
 iii) Number of photographs per flight line
 iv) Exposure interval. (08 Marks)

Module-5

- 9 a. Enumerate the advantage and limitations of remote sensing data. (08 Marks)
- b. What are the different types of resolutions used as parameters of sensor? (08 Marks)

OR

- 10 a. Explain with the help of a sketch, an idealized remote sensing system. (08 Marks)
- b. Write notes on components of a GIS. (08 Marks)

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