USN | | | | | | | | | |

17CV46

Fourth Semester B.E. Degree Examination, 4c0f an.2020
Advanced Surveying

Time: 3 hrs. Max. Marks: 100

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

Module-1

1 a. What is the relation between the degree of a curve and its radius? **(06 Marks)**

b. What are the requirements of an essential transition curve? **(06 Marks)**

c. A reverse curve AB is to be set out between two parallel railway tangents 32m apart. If the two arcs of the curve are to have same radius and the distance between tangents A and B is 160m, calculate the radius. The curve is to be setout from AB at 10m intervals along that line. Calculate the length of offsets. **(08 Marks)**

OR

2 a. Explain how a simple circular curve is setout by perpendicular offsets from long chord. **(06 Marks)**

b. Explain the features of vertical curves. **(04 Marks)**

c. Two straights AC and CB are intersected by a third line MN such that ZCMN = 45° 30' and LCNM = 35' 30' and the distance MN = 320m. Find the radius of the curve which will be tangential to the three lines AC, MN and CB. If the chainage of the intersection point C is 4875.50m, calculate the chainages of the point of curve A and the point of tangency B. (10 Marks)

111odule-2

3 a. Explain first order, second order and third order triangulation systems. **(06 Marks)**

b. Explain the three kinds of errors. **(06 Marks)**

c. From a satellite station S, 5.8m from main triangulation station A, the following directions were observed:

A	0°	0'	0"
B	132°	18'	30"
C	232°	24'	6"
D	296°	6'	11"

The lengths of 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. What are the important factors to be considered in selection of site for a base line? **(06 Marks)**

b. Explain Satellite stations and reduction to centre. **(06 Marks)**

c. Find the most probable values of the angles A and B from the following observations at a station 0. **(08 Marks)**

A = 9°	48' 36.6"	Weight 2
B = 54^0	37' 48.3"	Weight 3
A + B = 104'	26' 28.5"	Weight 4

Module-3

5 a. Define the terms, celestial sphere, prime vertical and hour angle. **(06 Marks)**

b. Explain the solution of spherical triangle by Napiers rule. **(06 Marks)**

c. Determine the azimuth and altitude of a star from the following data:
Declination of star = 20° 30' N
Hour angle of star = 42° 6'
Latitude of observer = 50°N **(08 Marks)**

OR

6 a. Mention the properties of a spherical triangle. **(06 Marks)**

b. Calculate the distance in kilometers between two pint A and B along the parallel of latitude, given that:
i) Lat. of A, 28° 42' N; longitude of A, 31' 12' W
Lat. of B, 28° 42' N; longitude of B, 47° 24' W
ii) Lat. of A 12° 36' S; longitude of A, 115° 6' W
Lat. of B 12° 36' S; longitude of B, 150° 24' E. **(08 Marks)**

c. The standard time meridian in India is 82° 30' E. If the standard time at any instant i-20hours, 24 min, 6 secs, find the local mean time for a place having 20°E longitude. **(06 Marks)**

Module-4

7 a. Define: vertical photograph, tilted photograph and oblique photograph. **(06 Marks)**

b. Describe how mosaic differs from a map. **(06 Marks)**

c. A section line AB appears to be 10.16 ems on a photograph for which the focal length is 16cms. The corresponding line measures 2.54 ems on a map which is to a scale of 1:50000. 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. Define: Perspective projection, Nadir point and tilt. **(06 Marks)**

b. List the reasons for keeping overlap in photographs. **(06 Marks)**

c. What is relief displacement? Derive its expression. **(08 Marks)**

Module-5

9 a. Mention the advantages of total station and describe its working principle. **(10 Marks)**

b. What is GIS? Mention its applications to Civil Engineering. **(10 Marks)**

OR

10 a. Explain the working principle of GPS. What are the differences between hand held GPS and differential GPS? **(10 Marks)**

b. What are the advantages of LIDAR technology? **(10 Marks)**