ACHARYA INSTITUTE OF TECHNOLOGY
Library
Date.----
BANGALORE

CBCS SCHEME

USN | | | | | | | | | | |

17CV46

Fourth Semester B.E. Degree Examination, June/July 2019
Advanced Surveying

Time: 3 hrs. Max. Marks: 100

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

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.

Module-1

1 a. With the help of a neat sketch of a simple circular curve? Explain.
i) Tangent length ii) Length of long chord iii) Intersection angle
iv) Point of curve v) Point of tangency vi) Deflection angle. **(06 Marks)**

b. Define degree of a curve. Establish the relationship between degree of a curve and its radius. **(04 Marks)**

c. Two tangents intersect at a chainage (59 + 60), the deflection angle being 50° 30′. Calculate the necessary data for setting out a curve of 15 chains radius to connect the two tangents, if it is inteneded to set out the curve by Rankine's method of deflection angles. Take the peg interval equal to 100 links, the length of the chain being 20m (100 links). Draw the curve table. **(10 Marks)**

OR

2 a. What is transition curve? List the function and essential requirements of an ideal transition curve. **(06 Marks)**

b. Two straights BA and AC are intersected by a line EF. The angle BEF and EFC are 130° and 140° respectively. The radius of the first arc is 500m and that second arc 300m. Find the chainages of the tangent points and the points of compound curvature given that the chainage of the intersection point 'A' is 3200m. **(07 Marks)**

c. Two parallel railway lines are to be connected by a reverse curve. Each section having the same radius. If the lines are 12 meters apart and the maximum distance between tangent points measured parallel to the straights is 48meters, find the maximum allowable radius. If however, both the radii are to be different, calculate the radius of the second branch if that of the first branch is 60meters. Also, calculate the lengths of both the branches. **(07 Marks)**

Module-2

3 a. List the various factors that are to be considered in the selection of site for baseline and station in triangulation survey. **(06 Marks)**

b. Write a note on classification of triangulation system. **(06 Marks)**

c. From a satellite station 'S' which is 14m 'A', angles measured to 3 triangulations stations are as follows :
$\angle CSA = 32°45'48''$, $\angle BSC = 68°26'36''$ the length of sides, AC and AB are 5678m and 1441m respectively. Find the angle of BAC. **(08 Marks)**

OR

4 a. Explain the sources and kinds of errors. **(04 Marks)**

b. State and explain law of weights. **(08 Marks)**

c. Find the most probable values of ∠A and ∠B from the following observation @ a station '0'.
A = 9° 48′ 36″ ωt 2
B = 54° 37′ 48″ ωt 3
A +B = 104° 26′ 28″ ωt 4. **(08 Marks)**

Module-3

5 a. Define the following terms :
i) Zenith ii) Nadis ii) Azimuth iv) The altitude v) Celestial sphere. **(05 Marks)**

b. Mention the properties of a spherical triangle. **(05 Marks)**

c. Find the shortest distance between two points A and B, given :
A latitude — 18° 24′ N longitude 36° 18′E
B latitude — 68° 32′ N longitude 126° 34′E. **(10 Marks)**

OR

6 a. Define the following :
i) Latitude ii) Longitude iii) The visible Harizon iv) Sensible Horizon. **(04 Marks)**

b. Explain Ecliptic and solstices. **(06 Marks)**

c. At a point 'A' in latitude 45°N, a straight line is ranged out which runs due east at A. This straight line is prolonged for 300 nautical miles to B. find the latitude of B, and if it be desired to travel due north from B. So as to meet the 45° parallel again at 'C', find the ABC at which we must set out and the distance BC. **(10 Marks)**

Module-4

7 a. Define the terms :
i) Picture plane ii) Camera axis iii) Focal length iv) Principal plane
v) Perspective projection vi) Film Base. **(06 Marks)**

b. With a neat sketch, derive the expression for the scale of a vertical photograph. **(06 Marks)**

c. A vertical photograph was taken at an altitude of 1200m above MSL. Determine the scale of the photograph for the terrain laying at elevation of 80m and 300m. If the focal length of the camera is 15cm. **(08 Marks)**

OR

8 a. Define the terms : i) Drift ii) crab iii) mosaics. **(06 Marks)**

b. Explain the procedure for aerial survey. **(06 Marks)**

c. The scale of an aerial photography is 1cm = 100m. The photograph size is 20cm × 20cm. determine the number of photography required to cover an area 10km × 10km, if the longitudinal lap is 60% and side lap is 30%. **(08 Marks)**

Module-5

9 a. Define EDM. **(04 Marks)**

b. Mention the advantages of total station and also discuss the working principles of the same. **(08 Marks)**

c. Define remote sensing. Explain the applications in civil engineering. **(08 Marks)**

OR

10 a. What are the advantages of LIDAR technology? **(04 Marks)**

b. What is GIS? With a neat sketch, explain the components of GIS. **(08 Marks)**

c. What is GPS? Explain the basic principles of GPS and its application in surveying. **(08 Marks)**

* * * * *