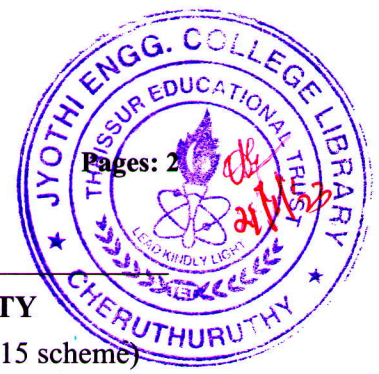


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Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S,FE) Examination January 2023 (2015 scheme)

Course Code: CE307

Course Name: GEOMATICS

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- 1 a) Why reverse curves are avoided on highways and main railway lines? (4)
- b) Explain with neat sketch how traverse can be balanced graphically. (7)
- c) Explain how checks for angular measurements are done for a closed traverse. (4)
- 2 a) Explain the direct method of traversing by theodolite without transiting with neat sketch. (5)
- b) A road bend which deflects 60° is to be designed for a maximum speed of 100 km per hour, a maximum centrifugal ratio of $\frac{1}{4}$ and the rate of gain of radial acceleration of 30 cm/sec^3 . The curve consists of a circular arc combined with two cubic spirals. Calculate the a) Radius of the circular arc, b) Requisite length of transition curve, c) Length of the circular arc and d) Length of the combined curve. (10)
- 3 a) Explain the method of setting out of compound curves with neat sketch. (5)
- b) Sketch and mark the elements of a simple circular curve. (3)
- c) A traverse was run among the stations A, B, C and D having the following observations. (7)

Line	Length (m)	W.C.B
AB	76.8	$140^\circ 12'$
BC	195.6	$36^\circ 24'$
CD	37.2	$338^\circ 48'$
DA	202	229°

Check whether the traverse ABCDA is closed. If not, find the amount and direction of error of closure.

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) Explain different errors that are possible in GPS observations. (10)
b) Explain the significance and method of establishing horizontal control points in a GPS survey. (5)
- 5 a) Explain code phase and carrier phase GPS measurements. (8)
b) Explain the general GPS field survey procedures performed at each station. (7)
- 6 a) Differentiate between Rapid static surveying and True kinematic surveying (5)
b) List the types of GNSS. (4)
c) Explain visibility diagram with a neat sketch. (6)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) What is spectral reflectance? Sketch and explain the typical spectral reflectance curves for soil and water. (10)
b) Differentiate between raster and vector data representation. (10)
- 8 a) Explain different GIS operations. (6)
b) Classify and explain map projections based on the development surface used. (7)
c) List and explain the types of scattering of electro-magnetic radiation in the atmosphere. (7)
- 9 a) Explain the types of observation platforms used in remote sensing. (6)
b) Discuss the significance of atmospheric windows in remote sensing. Also list the major atmospheric windows available for remote sensing. (7)
c) Explain buffering and overlay in GIS. (7)
