Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, DECEMBER 2024

GEOINFORMATICS
IV Semester
GI 5404 GEODESY
(Regulation 2019)

Time: 3hrs

Max.Marks: 100

CO 1	Understand the Geometry of the earth, Gravity and its relationship with nature
CO 2	Understand the procedure for establishing horizontal and vertical Geodetic control and its adjustment procedure
CO 3	Determination of Azimuth, Latitude, Longitude and Time by Geodetic astronomical observations.
CO 4	Provide the various aspects of Geometric and Physical Geodesy.
CO 5	Inculcate the different height systems used to solve the field problems.

BL – Bloom's Taxonomy Levels (L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	What are the applications of Geodesy?	2	1	L1
2	Draw a diagram indicating various reference surfaces used in Geodesy	2	1	L3
3	Differentiate Geodetic, Geocentric and Reduced Latitudes	2	2	L4
4	Write any four properties of Geodesic.	2	2	L1
5	Write different time systems used in Geodesy	2	3	L2
6	Distinguish Prime Vertical Crossing and Elongation of Star.	2	3	L4
7	Define Geopotential Surface.	2	4	L1
8	Why corrections are required for gravity measurement?	2	4	L4
9	What is Dynamic Height?	2	5	L1
10	Derive an expression for Normal correction	2	5	L3

PART- B (5 x 13 = 65 Marks)

(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a) (i)	Discuss important developments in the field of Geodesy	9	1	L1
(ii)	Write the advantages of Local Ellipsoid over Global Ellipsoids	4	1	L2
	OR			
11 (b) (i)	Write Short Notes on Engineering, Planetary and Interferometric Geodesy	9	1	L1
(ii)	Explain the Direct and Indirect Problems in Geodesy	4	1	L2
12 (a) (i)	Deduce the expressions for Radius of Curvature along Meridian and Prime Vertical from basic principles with suitable figure.	9	2	L4
(ii)	On WGS 84 spheroid, Compute the mean radius of curvature of Tamilnadu, given the mean geodetic latitude as 10° 22' 00 " N and azimuth of the line joining a point at Nagarcoil and Chennai as 31° 30'	4	2	L4
	OR			

12 (b) (i)	Why do you require to develop a Geodetic Control Network? Analyse various methods used for Geodetic Control Surveys.	13	2	L4
13 (a) (i)	It is proposed to conduct astronomical observations from a place with latitude of 10° 40' to two starts with declination of 75° and 82°. Compute the hour angle and azimuth of the starts at the time of rising and setting of stars and also compute the zenith distance of the starts if the stars are said to be culminated.	13	3	L3
	OR			
13 (b) (i)	Derive the expressions required for converting various celestial co-ordinates to Geodetic co-ordinates and vice versa.	13	3	L3
14 (a) (i)	Describe the methods adopted for deriving relative gravity and their advantages	13	4	L1
	OR			
14 (b) (i)	What is Deflection of Vertical? Discuss various methods used for calculating deflection of vertical.	8	4	L1
(ii)	Derive normal gravity of a point with geocentric latitude is 13° 30' 00" N.	5	4	L1
15 (a) (i)	Derive expression for calculating dynamic, orthometric and normal heights from spirit levelled heights.	13	5	L3
	OR			
15 (b) (i)	Levelling from A to F has got five sections. The mean gravities observed in five sections are 976, 979, 978, 978.5and 976 gal respectively. Height differences in these sections are 150m, 200m, -150m, 100m, and -100m respectively. Given the dynamic height of A as 1000m, compute the following: a. The dynamic height of F, correct up to mm. b. The orthometric height of A if the gravity there is 976.6 gal. c. The orthometric height of F if the gravity there is 979.4 gal. d. The height of F if the gravity is not used at all from A to F.	13	5	L3

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16.	Given the following on point determination by polar method, compute the co-ordinate of the point P.	15	2	L5

Point No	Easting (m)	Northing (m)	Observed	
			Direction	Distance (m)
P	16,020.64	6,411.76	00° 24' 17"	115.98
Q	17,218.85	6,385.30	170°21'20"	149.02