UPES
End Semester Examination, May 2024

Course: Geomatics Engg.	**Semester: IV**
Program: B Tech Civil Engineering	**Time : 03 hrs.**
Course Code: CIVL 2024	**Max. Marks: 100**

Instructions: Attempt all the questions

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	An observer standing on the deck of a ship just sees a lighthouse top with his eye at a height of 10 m. The top of the lighthouse is 100 m above m.s.l. Find the distance of the observer from the lighthouse.	4	CO1
Q2	What are the various systems of coordinates employed to locate the position of a celestial body?	4	CO2
Q3	Distinguish between the following: a) Plane and geodetic surveying b) Precision and accuracy	2+2	CO3
Q4	With the help of a schematic diagram, explain the GPS receiver and equipment segment.	4	CO3
Q5	With the help of an example explain how you will measure the horizontal angle by the method of repetition.	4	CO1

SECTION B
(4Qx10M= 40 Marks)

Q6.	Explain the various filed checks in triangulation with the help of an example.	10	CO2
Q7.	With the help of an example, explain how you will measure the height of an inaccessible building if you are given tape and a Total Station.	10	CO1
Q8.	For the given below vector data structure, give the corresponding raster data structure using both a) Coarse grid b) Fine Grid	10	CO3
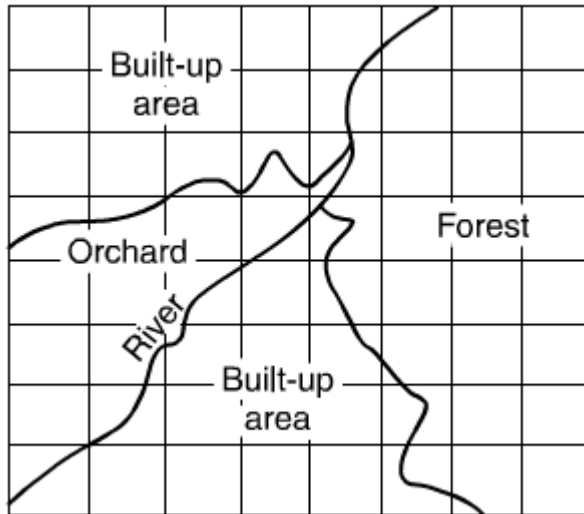
OR

Evaluate the performance of GIS interpolation techniques concerning their merits and demerits.

Q9	The height of a transit station has been computed from the measurement of a slope distance, **L = 279.1 ± 0.06 m** **Vertical angle, α = 3°20 ± 30.** Estimate the probable error in the calculated elevation of station A.	10	CO1

SECTION-C
(2Qx20M=40 Marks)

Q10	Two points A and B having elevations of 650 m and 250 m, respectively, above the datum, appear on a vertical photograph obtained with a camera of focal length of 250 mm and flying altitude of 2700 m above the datum. Their correlated photographic coordinates are as follows:	20	CO2

Point	Photographic Coordinates	
	X (cm)	Y (cm)
a	+3.65	+2.54
b	-2.25	+5.59

Determine the length of the ground line AB.

OR

Explain the criterion for the selection of the station. Observations were made on the center of a 10 cm diameter signal, from the instrument at A. The distance AB is 6 km, and the sun makes an angle of 50° with the line

	AB. Determine the phase error if the observations are made on the bright portion.		
Q11	a) Derive the expression for displacement due to ground relief. b) Evaluate the working of IRNSS (Indian Regional Navigation Satellite System). c) With the help of a diagram, analyze the spherical triangle, azimuth, and latitude of a celestial sphere.	**8+8+4**	**CO4**