UPES
End Semester Examination, May 2023

Course: Surveying and Geomatics   Semester: IV
Program: B Tech Civil Engineering   Tim: 03 hrs.
Course Code: CIVL 2018   Max. Marks: 100

Instructions: Assume the suitable values wherever required

Attempt all the questions.

SECTION A
(5Qx4M=20Marks)

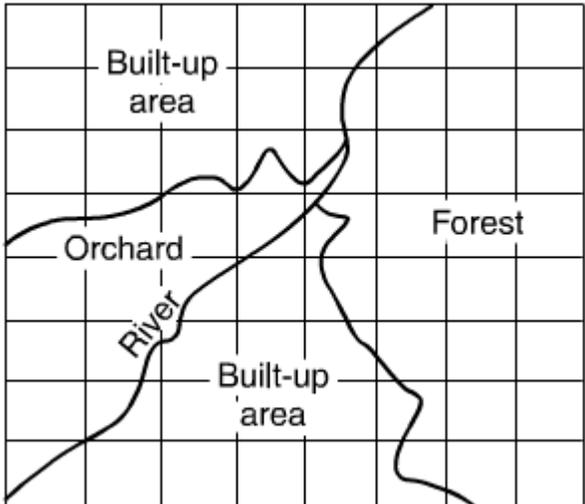| S. No.		Marks	CO

Q 1	Differentiate between:
	  a) Plane and geodetic survey
	  b) Level line and plumb line
		4	CO1

Q 2	The following perpendicular offsets were taken from a chain line to an irregular boundary: 	Chainage (m)	0	30	60	90	120	150
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Offset lengths (m)	0	2.65	3.80	3.75	4.65	3.60 | Calculate the area between the chain line and the irregular boundary.	4	CO2
Q 3	A surveyor standing on the deck of a ship just sees a lighthouse top with his eye at a height of 12 m. The top of the lighthouse is 72 m above m.s.l. Calculate the distance of the surveyor from the lighthouse.	4	CO1
Q 4	Explain the various filed checks in triangulation with the help of an example.	4	CO3
Q 5	A circular curve has a 500 m radius and 45° deflection angle. Calculate: (i) Apex distance, and (ii) Mid-ordinate. (Assume chord length of 20m)	4	CO4
SECTION B **(4Qx10M= 40 Marks)**			
Q 6	A railway embankment is 12 m wide. The ground is level in a direction transverse to the centre line. Calculate the volume contained in a 100 m length by trapezoidal rule and prismoid rule, if the side slope is 1.5:1. The centre heights at 20 m intervals are 3.7 m, 2.6 m, 4.0 m, 3.4 m, 2.8 m, 3.0 m, 2.2 m.	10	CO2

Q 7	For the given below vector data structure, give the corresponding raster data structure using both a) Coarse grid b) Fine Grid	10	CO1
Q 8	Determine the gradient from a point P to another point Q from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertical.	10	CO3

OR

Q 8	With the help of an example, explain how you will measure the height of an inaccessible building if you are given a tape and a theodolite? Draw a neat figure and use the vertical angles in your calculation.	10	CO3
Q 9	Fill up the missing quantities and apply the usual checks for the following entries of a field book:	10	CO1

Station	BS	IS	FS	Rise	Fall	RL	Remarks
1	3.125					?	BM
2	?		?	1.325		125.505	TP
3		2.320			0.055	?	
4		?		?		125.850	

5	?		2.625		?	?	**TP**
6	1.620		3.205		2.165	?	**TP**
7		3.625			?	?	
8			?			123.090	**TBM**

SECTION-C
(2Qx20M=40 Marks)

Q 10	It is required to set out a curve of radius 100 m with pegs at approximately 10 m center. The deflection angle is 60°. Draw up the data necessary for pegging out the curve by each of the following methods: a) Offsets from long chord b) Offsets from tangent (Radial) c) Offsets from tangent (Perpendicular) d) Successive bisection of chords	**6+4+4+6**	**CO4**
	OR		
Q 10	In making a survey for a new road, the intersection point of two straights was found to be inaccessible. Four points P, Q, R, S (see Fig.) were therefore selected two on each straight, and the distance between Q and R was found to be 122.20 m. If the angle PQR was 169°47'40'' and the angle QRS 148°22'2'', draw up a table of deflection angles and chainage for setting out a 200 m radius curve by pegs driven at every 20 m through chainage. Chainage of Q = (140 + 90) chains.	**20**	**CO4**
Q11	A. Following are the bearings taken in a closed compass traverse:		

Line	FB	BB
AB	S37º30'E	N37º30'W
BC	S43º15'W	N44º15'E
CD	N73º00'W	S72º15'E
DE	N12º45'E	S13º15'W
EA	N60º00'E	S59º00'W

Compute the interior angles and correct them for observational errors.

10+10	**CO1**

	B. Explain the characteristics of contours. Also show that a closed contour line with one or more higher ones inside it represents a hill.		