Register No.: ....   Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (S), FEBRUARY 2023
CIVIL ENGINEERING
(2020 SCHEME)

Course Code: **20CET205**

Course Name: **Surveying and Geomatics**

Max. Marks: **100**   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. Discuss various types of bearings.
2. Define (i) Bench Mark (ii) Datum (iii) Reduced level.
3. Elaborate the horizontal angle measurement by repetition method using theodolite.
4. Explain the criteria for the selection of triangulation stations.
5. Discuss various types of errors in surveying.
6. Explain latitude and departure of a survey line.
7. Elaborate on curves and the need for providing them.
8. A circular curve has a 200m radius and 65° deflection angle. Calculate: 1) tangent length 2) apex distance 3) mid ordinate.
9. Differentiate between active and passive systems of remote sensing.
10. Illustrate the principle of position determination by satellite ranging.

PART B
(Answer one full question from each module, each question carries 14marks)
MODULE I

11. a) Discuss the characteristics of contours. (7)

     b) The following consecutive readings were taken with a dumpy level: 3.150, 2.245, 1.125, 0.860, 3.125, 2.760, 1.835, 1.470, 1.965, 1.225, 2.390 and 3.035m. The instrument was shifted after the fourth and ninth readings. The reduced level of first reading is 98.085 m. Prepare a page of level book and find the reduced level of all points by rise and fall method. (7)

OR

12. a) Describe Ranging and various types of ranging. (7)

b) A compass traverse ABCDEA was run anticlockwise and the following bearings were taken where local attraction was suspected. Determine the local attraction and the correct bearings.   (7)

Line	FB	BB
AB	150°0´	329°45´
BC	77°30´	256°0´
CD	41°30´	222°45´
DE	314°15´	134°45´
EA	220°15´	40°15´

MODULE II

13. a) Explain mass diagram with figure. Describe its characteristic features.   (7)

b) The perpendicular offsets taken at 10m intervals from a survey line to an irregular boundary are 2.25 m, 3.85 m, 4.5 m, 6.8 m, 5.2 m, 7.35 m, 8.9 m, 8.3 m, and 5.45 m. Calculate the area enclosed between survey line, the irregular boundary, the first and the last offsets by a) Simpson's rule b) trapezoidal rule.   (7)

OR

14. a) Discuss various types of signals used for triangulation survey with figures.   (7)

b) From a satellite station O, 6 m from the main triangulation station P, the following directions were observed
P = 0° 0'0", Q =140° 18'30", R =230° 20'4",S =290° 4'10"
The length PQ, PR and PS were computed to be 3260 m, 4020.4 m and 3082.6 m respectively. Determine the directions of PQ, PR and PS.   (7)

MODULE III

15. a) State any five laws of weights of observation.   (5)

b) The angles of a triangle A,B,C are:
A=77°14'10" weight 4
B=49°40'35" weight 3
C=53°04'52" weight 2
Find the most probable values of the angles A, B and C using normal equations.   (9)

OR

16. a) Explain transit method of balancing traverse.   (5)

b) Following are the condition equations of different weights. Determine the most probable values for x, y and z.   (9)
$4x + 2y + z – 11 = 0$, wt:3
$3x + 3y + 2z – 9 = 0$, wt:2

$5x + y + 3z - 16 = 0$, wt:4

MODULE IV

17.	a)	Summarize the uses and advantages of total station.	(7)
	b)	Describe the principle of Electromagnetic Distance Measurement and the types of EDM instruments with examples.	(7)

OR

18.	a)	Explain different triangulation figures with sketches.	(7)
	b)	Elaborate on the classification of circular curves with sketches.	(7)

MODULE V

19.	a)	Explain resolution and various types of resolution	(7)
	b)	Discuss the components of satellite signal? Explain its functions.	(7)

OR

20.	a)	Enumerate various methods GPS surveying and compare them.	(10)
	b)	Explain i) raster data ii) vector data in GIS	(4)

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