

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

THIRD SEMESTER B.TECH DEGREE EXAMINATION (Regular), DECEMBER 2022**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. Explain the principles of surveying.
2. Illustrate the method of ranging a chain line across a rising ground.
3. Explain any three uses of mass haul diagram.
4. Define the terms a) Satellite station b) Reduction to centre
5. Outline the checks in a closed traverse
6. Define the terms a) weight of an observation b) normal equation
7. Explain the elements of a simple curve.
8. Write short note on valley curve and summit curve.
9. Outline the method of position calculation using satellite ranging.
10. Write short note on Multi spectral scanning.

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

11. a) The following bearings were observed on a compass traversing. At what stations do you suspect local attraction? Find the corrected bearings.

Line	FB	BB
AB	38° 30'	219° 15'
BC	100° 45'	278° 30'
CD	25° 45'	207° 30'
DE	325° 15'	145° 15'
EA	190° 30'	10° 15'

(8)

- b) Explain the characteristics and uses of contouring.

(6)

OR

12. a) Differentiate between profile levelling and cross sectioning with neat sketches. (6)
- b) The following consecutive readings were taken with a level and 4 m levelling staff on continuously sloping ground at a common interval of 30 m. 0.585, 0.935, 1.955, 2.840, 3.650, 3.940, 0.965, 1.035, 1.680, 2.535, 3.845, 0.965, 1.580, 3.020. The first reading was on A and the last reading was on B. The elevation of A is 100 m. Calculate the reduced levels of all points and show the check. (8)

MODULE II

13. a) The following perpendicular offsets were taken from a chain line to a boundary.

Chainage	0	15	30	45	60	70	80	100	120	140
Offset	7.6	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate the area between survey line, boundary and end offset by trapezoidal rule. (7)

- b) Explain the measurement of horizontal and vertical angles using theodolite. (7)

OR

14. a) Two triangulation stations A and B are 50 km apart and have elevations of 230 m and 250 m respectively. The intervening ground may be assumed to have a uniform elevation of 200 m. Calculate the minimum height of signal required at B so that the line of sight may not pass near the ground than 2 meters. (8)
- b) Explain Trapezoidal rule and Simpson's rule for the calculation of area. (6)

MODULE III

15. a) A closed traverse ABCDA is conducted in field. The survey details are given below. Compute the coordinates for the traverse by applying correction to consecutive coordinates by Bowditch rule.

Line	Length (m)	Bearing
AB	371	$0^{\circ} 42'$
BC	164	$94^{\circ} 42'$
CD	245	$183^{\circ} 04'$
DA	192.5	$232^{\circ} 51'$

(8)

- b) Explain various methods to determine most probable value.

(6)

OR

16. a) Following are observed value of A, B and C at a station the angles being subject to the condition $A+B = C$

$$A = 30^{\circ}12'28.2''$$

$$B = 35^{\circ}48'12.6''$$

$$C = 66^{\circ}0'44.4''$$

(6)

Find the most probable values of A, B and C.

- b) Define closed traverse. Explain Bowditch's and Transit method for balancing a closed traverse.

(8)

MODULE IV

17. a) Two tangents intersect at chainage 3450 m. A right-handed simple curve of 250 m radius joints them. the deflection angle between two straights is 50° . Calculate all data necessary for setting out a curve by Rankine's method of deflection angles. Take the chord interval as 20m.

(10)

- b) List the advantages and applications of total station.

(4)

OR

18. a) Why transition curves are introduced on horizontal curves of highways or railways? Explain the various methods to calculate

(7)

length of a transition curve.

- b) Explain the principle and working of total station. (7)

MODULE V

19. a) List down the components of GPS and explain the functions of each component. (7)

- b) Explain remote sensing. Differentiate between active and passive sensors in remote sensing. (7)

OR

20. a) Describe in detail about GPS surveying methods. (8)

- b) Differentiate between geographic coordinate system and projected coordinate system in GIS. (6)
