Reg No.:_____ Name:_____

0800CET205122005

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree Examination December 2021 (2019 scheme)

Course Code: CET205

Course Name: SURVEYING & GEOMATICS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks Marks

1 How ranging of a line is accomplished across a rising ground? Illustrate with necessary diagrams (3)

2 Define a) Bench mark b) Level surface c) Reduced level (3)

3 Explain Trapezoidal rule and Simpson's rule for the calculation of area. (3)

4 How will you take field observations with a theodolite so as to eliminate error due to eccentricity of verniers and centres? (3)

5 Distinguish between a) Closed traverse and open traverse b) closing error and relative error of closure. (3)

6 Define a) Most probable value b) Weight of an observation c) Conditioned quantity. (3)

7 Two tangents intersect at a chainage 59 (chains) + 70 (links). The deflection angle is 60°15'. Determine the chainages of point of curve and point of tangency, if the radius of the curve is 15.5 chains. The length of chain is 20 m. (3)

8 Explain the principle of distance measurement in EDM based on transit time of electromagnetic waves. Illustrate with sketch. (3)

9 Explain the principle of position determination by satellite ranging. (3)

10 Distinguish between passive and active remote sensing. (3)

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

11 (a) The magnetic bearing of a line at a station point is 187°. The declination at that particular point is 4°E. Calculate the true bearing of the line. (4)

(b) ABCDEA is a closed traverse. The observed bearings of the lines of the traverse are shown below. Local attraction was suspected at that area. Find the (10)

corrected bearings of the lines.

Line	Fore bearing	Back bearing
AB	$72^0 45'$	252°00'
BC	349°00'	167°15'
CD	298°30'	118°30'
DE	229°00'	48°00'
EA	135°30'	319°00'

12 (a) Explain profile levelling and cross sectioning with the help of sketches. (4)

(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. (10)

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 500 m. Rule out a page of level field book and enter the above readings. Calculate the reduced levels of the points and show the check. Determine the gradient of the line AB.

Module 2

13 (a) The offsets taken from a chain line to an irregular boundary is shown below. Calculate the area between the chain line, the irregular boundary and the first and last offset by Simpson rule. (7)

Distance (m)	0	15	30	45	60	75	90	105	120
Offsets (m)	3.18	4.62	6.06	5.61	4.92	6.24	6.72	5.79	5.28

(b) Explain stadia system and tangential system of tacheometric measurements. (7)

14 (a) Explain the terms (i) satellite station ii) reduction to centre with the help of sketches (6)

(b) Explain computation of volume of earthwork using i) Average end area method and ii) Prismoidal formula (8)

Module 3

15 (a) Explain Bowditch's method and Transit method for balancing a closed traverse. (6)

(b)The table below gives the lengths and bearings of the lines of a traverse (8)

ABCDEA, the length and bearing of EA have been omitted. Determine the length and bearing of the line EA.

Line	Length (m)	Bearing
AB	206	88°30'
BC	230	21°20'
CD	190	280°
DE	190	210°
EA	?	?

16 (a) Explain any three laws of weight with the help of examples (6)

(b) Find the most probable value of the angles A and B from the following observations at a station O (8)

A= 49°50'36.6" weight 2

B = 55°37'46.3" weight 3

A+ B = 104°25'27.5" weight 4

Module 4

17 (a) Explain the method of setting out of a simple circular curve using Rankine's method of tangential angles. Support the answer with sketch. (8)

(b) Mark the elements of a compound curve on a neat sketch and write down the relationship between different elements (6)

18 (a) Explain any two methods for determination of length of transition curve. (6)

(b) Explain the field procedure for finding out co-ordinates of points using a total station. (8)

Module 5

19 (a) What is meant by spectral reflectance? Explain the reflectance characteristics of vegetation, soil and water with the help of spectral reflectance curve. (7)

(b) What is meant by multispectral scanning? Explain along track and across track scanning. (7)

20 (a) Explain static and rapid static methods of GPS survey. (7)

(b) Explain geographic coordinate system and projected coordinated system. (7)

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