

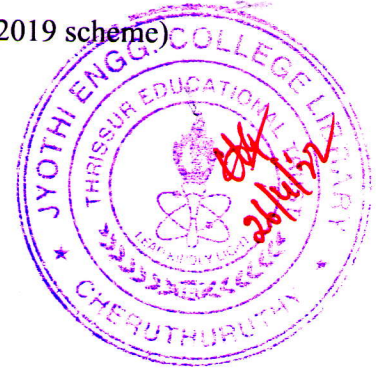
Reg No.: _____

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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 $60^{\circ}15'$. 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 $4^{\circ}E$. 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	$72^{\circ}45'$	$252^{\circ}00'$
BC	$349^{\circ}00'$	$167^{\circ}15'$
CD	$298^{\circ}30'$	$118^{\circ}30'$
DE	$229^{\circ}00'$	$48^{\circ}00'$
EA	$135^{\circ}30'$	$319^{\circ}00'$

- 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. (7)
- Calculate the area between the chain line, the irregular boundary and the first and last offset by Simpson rule.

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)
