Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) (FT/WP/S1PT) Examinations May/June 2026 (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 What is the difference between a plan and a map? (3)

2 Define contour. List out any two characteristics of contour forms (3)

3 State the trapezoidal and prismoidal rule for volume computation. (3)

4 Explain different triangulation systems used for geodetic surveying. (3)

5 Explain the term closing error. How do you find its magnitude and bearing? (3)

6 State principle of least squares. (3)

7 Why should we avoid the use of reverse curves in highways and high-speed tracks? (3)

8 Explain the principle behind electromagnetic distance measurement. (3)

9 Explain how a GPS can be used to obtain precise location details. (3)

10 List out the components of GIS. (3)

PART B

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

Module 1

11a) Explain advantages and disadvantages of plane table surveying. (6)

b) Following bearings were taken during a closed traverse survey with a compass in a place where local attraction was suspected. State the stations which are affected by local attraction. Also find the correct bearings for local attraction. (8)

Line	F.B	B.B
AB	$S36^0 15'E$	$N36^0 15'W$
BC	$S44^0 30'W$	$N45^0 30'E$
CD	$N71^0 45'W$	$S71^0 00'E$
DE	$N14^0 00'E$	$S14^0 30'W$
EA	$N61^0 15'E$	$S59^0 00'W$

12a) Explain the process of reciprocal levelling with neat sketches. How will you determine the level difference between two points? (6)

b) The following readings were taken in sequence during a levelling work: 1.605, 2.150, 1.385, 1.895, 1.365, 2.105, 1.950, 0.985, 1.305, 1.185, 1.305, -2.105, 1.385, 1.005, 1.155 and 1.145. The first reading was to a benchmark of R.L 100.000 m. Find the R.L of the remaining stations if the instrument was shifted after 3rd, 7th, 10th and 13th readings. (8)

Module 2

13a) Define Mass diagram. Describe its characteristics. (6)

b) The following offsets were taken from a chain line to a boundary. Find the area between the first and last offsets, the chain line and boundary using trapezoidal rule and prismoidal rule. (8)

Chainage (m)	0	15	30	45	60	75
Offset (m)	3.4	4.8	5.6	6.9	6.98	7.2

14(a) What are the fundamental lines of a transit? (6)

(b) A, B and C are the stations of a triangle. As station B could not be occupied, a satellite station S, 21.4 m from B was occupied. S and C were opposite sides of the line AB. The angles measured were ∠BSC = 61°18'24" and ∠ASC = 69°38'12". Length BC = 7180.55 m and length BA = 10357.67 m. Find the angle ABC. (8)

Module 3

15(a) Explain any two methods to balance a traverse. (6)

(b) Find the length and bearing of line BC from the available data given below. (8)

Line	AB	BC	CD	DA
Length (m)	156.5	-	234.8	203.1
Bearing	78°40'	-	251°18'	3°45'

16(a) State the laws of weights. (7)

(b) Find the most probable values of A, B and C given that A = 46°12'34", B = 22°18'36", C = A + B = 68°31'13" using normal equations. (7)

Module 4

17(a) Explain different types of vertical curves used. (4)

(b)	A curve of radius 300 m has a deflection angle of 76^0. It has to be set with Rankine's deflection angle method. Tabulate the values for the curve at 20 m peg intervals. The chainage at the first tangent point is given as 1008.65 m.	(10)
18(a)	What are the errors in total station survey?	(4)
(b)	What are the fundamental parameters that can be measured using total station?	(10)

Module 5

19(a)	Explain different image resolutions used for a satellite imagery.	(8)
(b)	Enumerate the various errors that might occur for a GPS survey.	(6)
20(a)	Define Map projections. What are the various classifications of Map projections based on developable surfaces- ?	(10)
(b)	Explain along track scanning with neat sketch	(4)

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