Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech Degree Examination December 2020 (2019 Scheme)

Course Code: CET205
Course Name: SURVEYING AND GEOMATICS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks Marks

1 Explain briefly the principles of levelling. (3)

2 With the help of a neat sketch, define the following terms; (3)

i) base line, ii) check line and iii) tie line.

3 Explain balancing of closed traverse by transit rule. (3)

4 What are the characteristics of contours? (3)

5 What are the elements of compound curves? Explain with a neat sketch. (3)

6 List out the components of GIS. (3)

7 What are the types of errors in surveying? Explain any one type. (3)

8 Differentiate between plane surveying and geodetic surveying. (3)

9 Explain any one method for surveying a forest area. (3)

10 Explain the principle of remote sensing. (3)

PART B

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

Module 1

11a) Define ranging and explain different types of ranging. (6)

b) The following readings were taken in a running closed compass traverse. (8)

Line	FB	BB
AB	39 °35’	219 °55’
BC	168 °20’	348 °10’
CD	114 °35’	294 °30’
DE	145 °35’	325 °35’
EA	255 °15’	75 °10’

i) State the stations which were affected by local attraction.

ii) Determine the corrected bearings

12a) What is reciprocal levelling? The following reciprocal levels were taken with one level. (7)

Instrument at	Readings on		Remarks
	A	B	
A	1.654	2.658	Distance AB=150m
B	0.362	1.795	R.L. of A= 185.75m

Determine, i) the true difference in elevation between A&B ii) the R.L. of B and iii) the collimation error

b) Explain profile levelling and cross-sectional levelling with the help of figures. (7)

Module 2

13a) For a proposed new road, the cross-sectional areas at different sections are as follows: (8)

Chainage (m)	100	120	140	160	180	200	220
Area (m^2)	22.4	32.5	40.8	48.6	28.5	20.0	11.7

Calculate the volume enclosed between chainages 100m and 220m by the prismoidal and trapezoidal formulae.

b) What is meant by face left and face right of theodolite? How would you change face? What instrumental errors are eliminated by face left and face right observations? (6)

14a) What are the characteristics and uses of mass diagram? (7)

b) An observer standing on the deck of a ship just sees the top of a lighthouse with his eyes at a height of 11m. The top of the light house is 58m above mean sea level. Find the distance of the observer from the lighthouse. (7)

Module 3

15a) Calculate latitudes, departures and closing error for the following traverse. Also, adjust the traverse using Bowditch's rule. (10)

Line	Length (m)	W.C.B.
AB	79.31	47°20'
BC	237.46	70°15'
CD	162.23	168°32'
DE	171.10	246°41'
EA	234.58	310°58'

b) Briefly explain different types of errors. (4)

16a) Define traversing, closed traverse, open traverse and closing error. (8)

b) The following mean values of the three angles of a triangle were observed. (6)

<A= 64°22’35”, weight= 8

<B= 38°56’18”, weight= 6

<C= 88°06’32”, weight= 4

Determine the most probable value of each angle.

Module 4

17a) Two tangents meet at chainage 1236m, the deflection angle being 42°. A circular curve of radius 400m is to be introduced in between them. Calculate the tangent length, length of circular curve, chainage of the tangent points and deflection angles for setting out the first three pegs and the last peg on the curve by Rankine’s method (pegs are to be fixed at 20m interval). (10)

b) Describe briefly the salient features of total station. (4)

18a) What is a transition curve? Explain the various elements of a transition curve. (7)

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

Module 5

19a) Explain (8)

i) raster data ii) vector data in GIS

b) Differentiate between active and passive systems of remote sensing. (6)

20a) Discuss electromagnetic energy and electromagnetic spectrum. (6)

b) Describe the various methods of GPS surveying. (8)

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