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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: CE307
Course Name: GEOMATICS (CE)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.   Marks

1 a) Compare fast needle method and loose needle method of traverse surveying.   (3)
   b) What is meant by closing error? How will you distribute the angular error of   (6)
       closure?
   c) The following are the lengths and magnetic bearings of the sides of a traverse   (6)
       ABCD. Find the error of closure.

Line	Length (metres)	Bearing
AB	470	340°52'
BC	640	85°40'
CD	430	170°40'
DE	560	265°12'

2 a) Explain any two methods of setting out simple curves.   (4)
   b) Explain the determination of length of transition curve by arbitrary gradient   (4)
       method and time rate method.
   c) The following data refer to a compound circular curve which deflects to the right   (7)
       Total deflection angle 95°, Degree of the first curve 4°, degree of the second
       curve 6°, Point of intersection of two straight is at 915m. Determine the chainages
       of the tangent points and point of compound curvature, given that the latter point
       is 126m from the point of intersection at an external angle of 290° from the first
       tangent.

3 a) Explain the method of balancing of closed traverse by Transit Rule.   (3)
   b) What are the field checks in a closed traverse and in an open traverse?   (4)
   c) Two tangents intersect at chainage 60 + 60, the deflection angle being 52°30'. (8)
       Calculate the necessary data for setting out a curve of 20 chains radius to connect
       the two tangents if it is intended to set out the curve by offsets from chords. Take
       peg interval equals to 20 m and length of chain as 20 metres.

PART B
Answer any two full questions, each carries 15 marks.

4 a) Explain the components of GPS and the working principle.   (10)
   b) Explain the principle of position determination by satellite ranging.   (5)
5 a) Explain static and rapid static methods of GPS survey.   (10)
   b) What is meant by visibility diagram? Illustrate with sketch.   (5)

6 a) List the errors in GPS ranging. Explain any two in detail.   (8)

    b) What is meant by DGPS? Explain code based and carrier based DGPS techniques.   (7)

PART C

Answer any two full questions,each carries 20 marks.

7 a) What is meant by multispectral scanning? Explain along track and across track scanning.   (10)

    b) Describe the principle of remote sensing. Explain passive and active remote sensing.   (10)

8 a) Write short notes on: (6)
      i) Spatial data ii) Attribute data

    b) Explain geographic coordinate system and projected coordinated system.   (8)

    c) Explain Mercator projection. Write down its properties and limitations   (6)

9 a) What is meant by spectral reflectance?Explain the reflectance characteristics of vegetation, soil and water with the help of spectral reflectance curve.   (10)

    b) List down the types of map projection according to projection surface. Explain any two with sketches.   (10)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CE307
Course Name: GEOMATICS (CE)

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks

Marks

1 a) Distinguish between closed traverse and open traverse.   (5)

   b) A closed traverse ABCDA is conducted in field. The survey details are as given below.   (10)

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

     Compute the coordinates for the traverse by applying correction to constitutive coordinates by Bowditch's rule.

2 a) Explain the graphical method of balancing of traverse for compass survey.   (5)

   b) Explain Rankine's method of setting out of a simple curve.   (5)

   c) What are the requirements of transition curve?   (5)

3 a) Show the elements of compound curve with a neat sketch.   (5)

   b) Two roads having deviation angle 40^0 at apex point V are to be joined by a 300 m radius circular curve. If the chainage of the apex point is 1200.2 m, calculate the ordinates from long chord at 15 m interval to set out the curve.   (10)

PART B
Answer any two full questions, each carries 15 marks

4 a) Explain the types of Global Navigational Satellite Systems.   (7)

   b) Explain the components and principles of GPS.   (8)

5 a) How is receiver position located by satellite ranging?   (4)

   b) What are the errors and biases of GPS?   (7)

   b) Explain DGPS.   (4)

6 a) What are the various GPS surveying Techniques? Compare the various techniques.   (10)

   b) Explain the planning and preparation phases of GPS Survey.   (5)

PART C
Answer any two full questions, each carries 20 marks

7 a) What is electromagnetic spectrum? State the wavelength regions, along with their   (8)

       uses, for remote sensing applications.

	b)	Differentiate between active and passive remote sensing.	(6)
	c)	Explain remote sensing observation platforms.	(6)
8	a)	Explain the energy interactions with atmosphere and earth.	(6)
	b)	What are the various resolutions in remote sensing?	(8)
	c)	What are the application areas of GIS and remote sensing?	(6)
9	a)	What are the components of GIS?	(6)
	b)	Describe briefly the raster and vector data structures. Discuss their relative advantages and disadvantages.	(8)
	c)	Explain Geographic and Projected coordinate systems.	(6)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018
Course Code: CE307
Course Name: GEOMATICS

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks.

Marks

1 a) Using a neat sketch explain axis method for balancing a traverse   (5)

   b) In a closed traverse *ABCDEFA,* the angles and the lengths of sides were
       measured as given below. Balance the traverse using Bowditch's method and
       compute the corrected co-ordinates if the co-ordinate of station A is (1500, 1500)

Line	Length (m)	WCB
AB	355.52	58°30'00"
BC	476.65	185°12'30"
CD	809.08	259°32'40"
DE	671.18	344°35'40"
EF	502.20	92°30"30"
FA	287.25	131°22'00"

   (10)

2 a) Mark the elements of a compound curve on a neat sketch and write down the   (5)
       relation ship between different elements.

   b) Two straights intersect making a deflection angle of 59°24', the chainage at the   (10)
       intersection point being 880 m. The straights are to be joined by a simple curve
       commencing from chainage 708 m. If the curve is to be set out using 30-m
       chords by the method of offsets from the chord produced, determine the first
       three offsets.

3 a) Why should we avoid the use of reverse curve in highways and high-speed
       tracks   (4)

   b) Explain setting out of a simple circular curve using two theodolite method   (5)

   c) Sketch the different types of vertical curves   (6)

PART B
Answer any two full questions, each carries 15 marks.

4 a) Explain the signal structure used in GPS.   (5)

   b) Illustrate satellite ranging procedure.   (5)

   c) How does satellite geometry affect satellite positioning precision   (5)

5 a) List the advantages and disadvantages of GPS surveying methods   (6)

   b) What is static, rapid static and kinematic GPS positioning methods   (9)

6 a) What is code phase and carrier phase measurements (6)

b) Detail the procedure for data processing and report preparation in a GPS survey (9)

PART C
Answer any two full questions, each carries 20 marks.

7 a) What is remote sensing and how is it carried out? (6)

b) With a neat sketch, explain spectral reflectance of vegetation (6)

c) Explain along track and across track scanning with figures. (8)

8 a) List out the applications of remote sensing. (4)

b) Write a note on the energy interactions in the atmosphere. (8)

c) Explain spatial and attribute data, vector and raster data used in GIS. (8)

9 a) Explain the step by step procedure for preparing a GIS map (10)

b) Detail the different types of map projections according to the projection surface used (10)

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