

Reg No.: _____

Name: _____

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 closure? (6)
 c) The following are the lengths and magnetic bearings of the sides of a traverse ABCD. Find the error of closure. (6)

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 method and time rate method. (4)
 c) The following data refer to a compound circular curve which deflects to the right 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. (7)
- 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'. 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. (8)

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	$0^{\circ}42'$
BC	164	$94^{\circ}42'$
CD	245	$183^{\circ}04'$
DA	192.5	$232^{\circ}51'$

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° 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.

- 1 a) Using a neat sketch explain axis method for balancing a traverse (5) Marks
- b) In a closed traverse *ABCDEF A*, 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"	(10)
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"	

- 2 a) Mark the elements of a compound curve on a neat sketch and write down the relation ship between different elements. (5)
- b) Two straights intersect making a deflection angle of 59°24', the chainage at the 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. (10)
- 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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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
V SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

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) Explain successive bisection of chord method to set out simple circular curve. (7)
- b) Explain error of closure with the help of a sketch. In a traversing, latitude and departure of the sides were calculated and it was observed that $\Sigma \text{latitude} = 1.39$ m and $\Sigma \text{Departure} = -2.17$ m. Calculate the length of the closing error and its orientation. (8)
- 2 a) Two tangents intersect at chainage 60 chain + 60 links, the deflection angle being $52^{\circ}30'$. 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 ordinate from long chords. Take peg interval equals to 20 m and length of chain as 20 metres. (10)
- b) Explain elements of a compound curve with a neat sketch. (5)
- 3 a) While making a traverse survey, a surveyor started from point A, walked 1000m in $S 67^{\circ} W$ and reached point B. Then he changed his direction and walked 512 m in $N10^{\circ} E$ and reached point C. Then again he changed his direction and walked 1504 m in $S 65^{\circ} E$ and reached point D. Now the surveyor wants to return to A. Which direction should he move in and how many meters? (10)
- b) Explain consecutive co-ordinates and independent co-ordinates. (5)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) Explain signal structure adopted in GPS surveying. Differentiate between code phase and carrier phase measurements. (8)
- b) List down GPS errors and explain any three in detail. (7)

- 5 a) Explain the different phases of GPS survey. (12)
b) List the parameters affecting the accuracy of GPS positioning. (3)
- 6 a) Explain the difference between rapid static method and kinematic method of GPS surveying. (10)
b) What is DGPS. How is it significant? (5)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) What are the types of scattering in Remote sensing? Differentiate between them. (8)
b) Write a short note on spatial data and attribute data. (6)
c) What is buffering in GIS data analysis? (6)
- 8 a) Explain electromagnetic spectrum and atmospheric window with the help of sketches. (10)
b) Brief on the four different image resolutions of Remote sensing (10)
- 9 a) Explain vector data model. Its advantages and disadvantages. (10)
b) What is RMS error? How is it significant in data analysis (5)
c) With proper sketch, differentiate cylindrical, planar and conical map projection (5)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FIFTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

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) Explain direct method without transiting in fast needle method of traversing with the help of suitable sketch. (7)
- b) Explain the elements of a simple circular curve, with a neat sketch. Derive relations between elements of a simple circular curve if radius and deflection angle is given. (8)
- 2 a) Adjust the closing error for the given traverse using Bowditch rule (10)

Line	Length (m)	WCB($^{\circ}$)
AB	160	46
BC	190	130
CD	200	220
DA	180	320

- b) A man travels from a point A, to west direction and reaches point B after 139.6m. Find the latitude and departure of line AB (5)
- 3 a) Explain Rankine's method for setting out simple circular curve. (10)
- b) Explain how you arrive at the length of transition curve based on rate of change of radial acceleration. (5)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) List down the components of GPS and explain the functions of each component. (10)
- b) Explain the principle of position determination by satellite ranging. (5)
- 5 a) List the errors in GPS surveying. Explain any four in detail. (10)
- b) Write a short note on visibility diagram. Illustrate with sketch. (5)

- 6 a) Explain the phases of GPS surveying. (10)
b) Explain static method of GPS surveying. (5)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain vector data model and raster data model. (8)
b) Describe the principle of remote sensing. Differentiate between active and passive sensors in remote sensing. (8)
c) Briefly explain the operations of GIS. (4)
- 8 a) What is meant by multispectral scanning? Explain along track and across track scanning. (10)
b) Explain image resolution and the different types. (10)
- 9 a) What is map projection in GIS? Explain the different types according to preserved property. (10)
b) Differentiate between geographic coordinate system and projected co-ordinate system. (5)
c) Briefly explain overlay in vector data analysis. (5)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

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) What are the angular checks in a closed traverse? (3)
- b) The consecutive coordinates of a theodolite traverse ABCDEA are given below. (12)
- Balance the traverse and find the adjusted values and independent coordinates, assuming that those of A are (200N, 100 E).

Line	Latitude		Departure	
	N	S	E	W
AB	21.98			68.04
BC		82.69		4.27
CD		41.57	13.48	
DE		13.54	36.04	
EA	115.33		22.36	

- 2 a) Calculate the offset at 25m intervals along the tangents to locate a curve of radius 500m by methods of i) radial offset ii) perpendicular offset. (8)
- b) Detail the steps in the setting out of a compound curve by deflection angle. (7)
- 3 a) The length and bearing of the sides of a closed traverse ABCDEA is given below. Determine the closing error of the traverse. (8)

Line	Length (m)	Bearing
AB	186	N 24° 30' E
BC	164	N 73 ° 18' W
CD	303	S 63 ° 44' W
DE	162	S 42 ° 30' E
EA	240	N 86 ° 08' E

- b) List the conditions to be fulfilled by a transition curve. (4)
- c) What is a reverse curve? (3)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) What are the components of GPS and their functions? (10)
- b) How does satellite geometry affect the accuracy of GPS? (5)
- 5 a) Distinguish between static and kinematic survey. What are the advantages of these methods? (5)
- b) Discuss the steps in the planning and preparation of GPS survey. (10)
- 6 a) What is the principle of working of DGPS? What are its advantages? (9)
- b) Enumerate the applications of GPS. (6)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Illustrate the effect of EM energy interactions with the earth's surface. (8)
- b) Distinguish between active and passive sensors. (6)
- c) Draw the electromagnetic spectrum specifying the spectral regions (6)
- 8 a) Illustrate the difference between spatial data and attribute data with example. (8)
- b) Enumerate the various methods of transformation from one coordinate system to another and their effect. (8)
- c) Discuss the various sources of data input in GIS. (4)
- 9 a) Write a note on multi spectral scanning. (8)
- b) Distinguish between temporal and radiometric resolution. (6)
- c) Explain clearly with example, the overlay operation in GIS. (6)
