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#### Code No: R21015/R10



II B.Tech I Semester Supplementary Examinations, June 2015 SURVEYING (Comm. to CE, PE)

Time: 3 hours

Max Marks: 75

## Answer any FIVE Questions All Questions carry equal marks \*\*\*\*

- 1. (a) Draw a neat sketch of a prismatic compass and explain it in detail.
  - (b) Explain bearing. What are different systems of designation of bearings. Explain.
- 2. (a) Explain the procedure of chaining. How will you record the measurements of Chain Survey. Enumerate the points to be kept in view while booking the field notes.
  - (b) A Survey line BAC crosses a river, A and C being on the near and opposite banks respectively. A perpendicular AD 40m long is set out at A. If the bearings of AD and DC are 38<sup>0</sup> 45<sup>1</sup> and 278<sup>0</sup> 45<sup>1</sup> respectively and the chainage at A is 862m. find the chainage at C.
- 3. (a) Describe the two peg test for the adjustment of line of collimation.
  - (b) What is the desired relation and necessity of the above adjustment?
- 4. (a) List the methods of calculating are as from offsets to a base-line.
  - (b) Explain the trapezoidal rule.
  - (c) How does the trapezoidal rule compare with other rules.
- 5. The following lengths and bearings were recorded in running a Theodolite traverse. Determine the omitted observations, the length & bearing of SP.

Line	Length (m)	WCB
$\mathbf{PQ}$	255	$14^0 \ 042'$
QR	656 💊	$35^0 \ 00'$
RS	120	$338^0 \ 42'$
SP	_	_

- 6. (a) What are the various errors in tacheometric surveying? Explain how they can be minimized.
  - (b) Following observations were taken with a tacheometer fitted with an anallactic lens having value of constant to be 100.

Inst. Station	Staff station	R.B	Vertical angle	Staff reading
0	Р	N370W	$4^{0}12'$	0.910; 1.510; 2.110
0	Q	N230E	$5^{0}42'$	1.855; 2.705; 3.555
Calculate the horizontal distance between P and O				

Calculate the horizontal distance between P and Q



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7. (a) What are the elements of a simple circular curve. Give their relationships.

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- (b) Two roads meet an angle of  $127^030'$ . Calculate the necessary data for setting out a curve of 15 chains radius to connect two straight portions of the road if it is intended to set out the curve by chain and offsets only. Take length of chain as 30m
- 8. Explain about the segments of Global Positioning system?





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- 1. (a) Describe plane Table intersection method with the help of neat sketches. Under what circumstances this method is resorted to.
  - (b) Explain the various sources of errors in plane Table Surveying.
- 2. (a) Explain the procedure of chaining. How will you record the measurements of Chain Survey. Enumerate the points to be kept in view while booking the field notes.
  - (b) A Survey line BAC crosses a river, A and C being on the near and opposite banks respectively. A perpendicular AD 40m long is set out at A. If the bearings of AD and DC are 38<sup>o</sup> 45<sup>1</sup> and 278<sup>o</sup> 45<sup>1</sup> respectively and the chainage at A is 862m. find the chainage at C.
- 3. (a) What is the difference between the "temporary" and "permanent adjustments" of a level?
  - (b) Name the temporary and permanent adjustments of a level. State the desired relations.
- 4. (a) State and explain the sinpsons rule.
  - (b) How does it compare with other rules.
- 5. The table below gives the lengths and bearings of the lines of a traverse ABCDEA, the length and bearing of EA having been omitted. Calculate the length and bearing of the line EA.

Line	Length (m)	Bearing
AB	204.0	87 <sup>0</sup> 30′
BC	226.0	$20^{0}20'$
CD	187.0	$280^{\circ}0'$
DE	192.0	$210^{0}30'$
EA	?	?

6. A tacheometer is set up on a bench mark of R.L. 60.00m. The horizontal axis of the instrument is 1.240m above the bench mark. The following observations were made with staff held vertically:

Staff station	Vertical angle	Stadia hair reading	Central hair reading
А	$+3^{0}30'$	$0.400 \ 1.660$	1.030
В	$-8^{0}20'$	$0.900 \ 1.640$	1.270
С	$+9^{0}50'$	1.00 2.320	1.660

If the instrument constants k and c are 100 and 0.0m, respectively, determine the R.L. of the staff stations.



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- 7. (a) List out different methods of setting out simple curves. Explain Rankine's method of deflection angles for setting out a simple curve.
  - (b) Calculate the offsets at 15m intervals along the tangents to set out a simple circular curve of 300m radius.
- 8. Explain about the segments of Global Positioning system?

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# Answer any FIVE Questions All Questions carry equal marks $\star \star \star \star \star$

- 1. (a) Describe different types of chains and tapes commonly used in Surveying stating the advantages of each.
  - (b) Describe in detail how you would range and chain a line between two points which are not intervisible because of an intervening hillock.
- 2. (a) Explain the procedure of chaining. How will you record the measurements of Chain Survey. Enumerate the points to be kept in view while booking the field notes.
  - (b) A Survey line BAC crosses a river, A and C being on the near and opposite banks respectively. A perpendicular AD 40m long is set out at A. If the bearings of AD and DC are 38<sup>0</sup> 45<sup>1</sup> and 278<sup>0</sup> 45<sup>1</sup> respectively and the chainage at A is 862m. find the chainage at C.
- 3. With the help of neat sketches explain the uses of contour maps.
- 4. What are the methods of measuring volume ? Explain the measurement of volume from spot level.
- 5. (a) What do you understand by 'Temporary Adjustment'? Describe in brief the various temporary adjustments of a Theodolite.
  - (b) Discuss the procedure of measuring a horizontal angle with a theodolite
- 6. A tacheometer, fitted with an anallactic lens and having the multiplying constant 100 was set up at R which is an intermediate point on a traverse course AB. The following readings were taken with staff held vertically.

0	0			~
Staff station	Bearing	Vertical angle	Intercept	Axial hair reading
A	$40^{0}35'$	$-4^{0}24$	2.21	1.99
В	$22^{0}35'$	$-5^{0}12'$	2.02	1.90
Q 1 1 1 1 1	1 6 4		1.00 1	

Calculate the length of AB and the level difference between A and B.

- 7. (a) What are the usual difficulties in ranging simple curves and how are they obviated.
  - (b) Calculate the ordinates from a 150m long chord at 10m interval to set out a simple circular curve of  $8^0$



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- 8. (a) What are the similarities and differences between mapping and GIS?
  - (b) What is the role of Data Base Management in Geographical information System?
  - (c) Differentiate Thematic Map and Topographical Map.

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- 1. (a) List out the different accessories of plane table Surveying. Also explain the purpose for which they are used.
  - (b) State Three point problem in plane Table Surveying and describe how it is solved by Bessel's method.
- 2. (a) What are the essential differences between chain Survey and compass Survey. Under what circumstances compass Survey is preferred to other types of Surveys.
  - (b) Find which station is free from local attraction and work out the correct bearings.

Line	$\underline{\mathrm{F.B}}$	<u>B.B</u>
AB	$191^{o}45'$	13°00′00″
BC	$39^{o}30'$	$222^{0}00'30''$
CD	$22^{o}15'$	$200^{0}30'00''$
DE	$242^{o}45'$	$60^{0}45'00''$
EA	$330^{o}15'$	$147^{0}45^{\prime}00^{\prime\prime}$

- 3. List the advantages and disadvantages of an internal focusing telescope. Briefly describe it.
- 4. (a) List the methods of calculating are as from offsets to a base-line.
  - (b) Explain the trapezoidal rule.
  - (c) How does the trapezoidal rule compare with other rules.
- 5. (a) What do you understand by 'Temporary Adjustment'? Describe in brief the various temporary adjustments of a Theodolite.
  - (b) Discuss the procedure of measuring a horizontal angle with a theodolite
- 6. A tacheometer is used to obtain the difference of levels between two points A and B. The instrument is set up at another station C, and the following observations were taken.

Staff	Vertical angle	Stadia readings
A	$-6^{0}30'$	3.50, 2.815, 2.130
В	-8°30′	1.870, 0.990, 0.110

If the R.L of A is 100.0000, determine the R.L of B. also determine the horizontal distance of A from C. Take k=50.0 and C=0.50



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- 7. (a) Describe the method of setting out a simple circular curve by offsets from chords produced.
  - (b) Tabulate the necessary data for setting out the first five pegs of a circular curve with the following data. Angle of intersection of the straights = 145<sup>0</sup>, chainage of point of intersection = 1580m. Radius of the curve = 400m. The curve is to be set out by method of deflection angles with pegs at every 30m. Theodolite has a least count of 20".
- 8. (a) Describe Geodetic Survying ? When do you go for the Geodetic Survey.

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(b) Describe the spatial models available in Geographical Information System.

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