

MODEL - 1

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.
The figures in the right-hand margin indicate marks.

1. Answer all questions : [2 × 10 = 20]
- What is the difference between well conditioned triangle and ill conditioned triangle?
 - Define isogonic and agonic lines.
 - What is local attraction and how it is detected?
 - Name different types of chains, which are used in surveying.
 - Draw the conventional symbol of temple and level crossing.
 - Why optical square is used in surveying?
 - What is the principle of plane table surveying?
 - Define a level surface.
 - Define line of collimation.
 - Define contour interval.
2. Answer any six questions. [5 × 6 = 30]
- Find the included angles between lines AB and AC if their whole circle bearings are
 - AB 75°30' and AC 108°50'
 - AB 185°50' and AC 269°25'.
 - Enlist and explain the function of each of the instruments required for plane table surveying.
 - Write short notes on any two :
 - Fore bearing and back bearing
 - Magnetic declination
 - Plane surveying and geodetic surveying.
 - Explain the errors in chaining.
 - Explain how a chain is tested and adjusted in the field.

- The bearings were observed during traversing 182°35' and 126°30'. If the declination at the place is known to be 1°40' E. Then find the bearings of the line.
 - What is orientation ? What are the methods of orientation and describes any one of them ?
 - What is "face left" and "face right" observation in angular measurement by a theodolite and why it is necessary ?
3. The following observations were made during the testing of a level : [10]

Instrument at	Staff reading at station	
	A	B
A	1.225	1.75
B	0.850	0.500

- RL of station A is known to be 356.5. Calculate the RL of station B. Also calculate the error in line of collimation and state clearly whether it is inclined upwards or downwards.
4. The table below gives the length and bearings of the lines of traverse ABCDE, the length and bearing of EA having been omitted. Calculate the length and bearing of the line EA. [10]
- | Line | Length (m) | Bearings |
|------|------------|----------|
| AB | 204.0 | 87°30' |
| BC | 226.0 | 20°20' |
| CD | 187.0 | 280°0' |
| DE | 192.0 | 210°3' |
| EA | ? | ? |
- State the advantages and disadvantages of plane table surveying. [10]
 - Explain how will you measure the horizontal angles by a theodolite by method of repetition and reiteration. [10]

MODEL – 2

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.

The figures in the right-hand margin indicate marks.

1. Answer *all* questions : [2 × 10 = 20
 - (a) What is vertical circle in a theodolite ?
 - (b) What is the least count of a transit theodolite ?
 - (c) What is temporary bench mark ?
 - (d) When would you apply resection method in plane table survey ?
 - (e) What is a field book ? What kind of field book would you prefer and why ?
 - (f) Write down the adjustment of chain.
 - (g) What do you mean by compass surveying ?
 - (h) What are the principle of chain surveying ?
 - (i) Draw the conventional symbols of chain line, Temple, building and boundary line.
 - (j) What is cadastral surveying ?

2. Answer any six questions. [5 × 6 = 30]
- Find the combined correction for curvature and refraction for distance of (i) 3400 (ii) 1.29 km.
 - The co-ordinates of point A are 100 (Northing) and 200 (Easting) and that of point B are 100 (Southing) and 300 (Easting). Find the length of survey line AB?
 - Describe the method to measure magnetic bearing of a line.
 - An abstract form of a closed traverse is given below

Line	Length	Latitude	Departure
AB	80.0	+22.500	-68.450
BC	95.0	-81.755	-10.665
CD	53.0	-44.000	+15.550
DE	40.0	-12.250	+40.250
EA	125.0	+115.050	+23.315

Balance the traverse by Bowditch's rule.

- Describe briefly the temporary adjustments of a theodolite.
- What are the errors that may occur in plane table surveying?
- Latitude and departure of lines of a closed traverse ABCD are as follows :

Line	Latitude		Departure	
	N	S	E	W
AB	200.8	-	110.5	-
BC	-	230.3	220.9	-
CD	-	150.7	-	88.4
DA	180.2	-	-	243.0

Calculate the area of the traverse by latitude and double meridian method. The sides are measured in mt.

- A steel tape 20 m long, standardised at 15 °C with a pull of 10 kg was used to measure distance along a slope of 4°25'. If the mean temperature during measurement was 10°C and the pull applied 16 kg, determine the correction required per tape length. Assume co-efficient of expansion = 112

× 10⁻⁷ per °C, cross-sectional area of tape = 0.08 cm² and Young's Modulus E = 2.1 × 10⁶ kg/cm².

3. The following readings were taken in sequence during levelling work. [10]

1.505, 2.150 1.385, 1.890, 1.355, 2.115

1.955, 0.980 1.325, 1.175, 1.305 and 2.105.

The first reading was taken on a benchmark of 150 mt. Find the RLs of the remaining stations if the instrument was shifted after the 3rd, 7th and 10th reading. Use height of collimation method.

4. Find the area of closed traverse by calculation of area by co-ordinate method. [10]

Line	Latitude	Departure
AB	+ 225.5	+ 120.5
BC	- 245.0	+ 240.0
CD	- 180.5	- 140.5
DA	+ 200.00	- 220.0

5. A line was measured with steel tape 30m long standardised at 20°C with a pull of 150 N was used, the measured length being 1600 meter. The temperature at the time of measurement was 25°C and pull exerted was 170 N. Find the true length of the line if wt. of 1 cubic cm of steel is 0.08 N, wt. of the tape is 8 N. The coefficient of expansion of the material per 1°C = 3.5 × 10⁻⁶ and the modulus of elasticity of the material is 2.1 × 10⁵ N/mm². [10]

6. The bearings observed at the stations of a closed traverse are given below. Check whether the bearings are correct. If not, correct the bearings. [10]

Line	F.B.	B.B.	DIFFERENCE
AB	122°15'	302°15'	180
BC	66°00'	243°45'	177°75'
CD	308°15'	133°00'	175°15'
DA	198°00'	15°30'	182°15'

7. Write short notes on : [10]

- Gales traverse table.
- Curvature and refraction correction in levelling.

MODEL - 4

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.

The figures in the right-hand margin indicate marks.

1. Answer *all* questions : [2 × 10 = 20]
 - (a) Define “transiting”.
 - (b) Why two vernier readings are taken ?
 - (c) Define “Height of Instrument” in levelling.
 - (d) What is the use of Abney’s level and pentagraph ?
 - (e) What is telescope normal ?
 - (f) What are the sources of error in chain surveying ?
 - (g) What is meant by reconnaissance survey ?

- (h) Distinguish between suitability of radiation and intersection method.
- (i) What is meant by ranging of a line ?
- (j) How ranging rods are different from offset rods ?
2. Answer any six questions. [5 × 6 = 30]

- (a) List out the fundamental lines of a transit theodolite and indicate their significance.
- (b) Write Bowditch rule for balancing a traverse.
- (c) Distinguish between Rise fall method and height of instrument method.
- (d) Write down the different characteristics of contours.
- (e) The following observations were made during the testing of a level.

Instrument at	Staff reading at station	
	A	B
A	1.225	1.375
B	0.850	0.500

RL of station A is known to be 356.5. Calculate the RL of station B. Also, calculate the error in line of collimation and state clearly whether it is inclined upwards or downwards.

- (f) Explain how you will measure the horizontal angles by a theodolite by repetition method.
- (g) Describe the process of measuring vertical angle by using theodolite.
- (h) In the measurement of a distance of 30 m, the careless leader holds the forward end of the chain at 1m too high and 1.1 m out of line. Calculate the error in each case and also total error.
3. A line CAB crosses a river. A and B are on near and distant banks of the river respectively. Perpendiculars AD and CE are 30.5 m and 50.5 m respectively. Such that B, D and E are in a straight line. If the chainage of A is 550.5 m and AC = 45 m, then calculate the chainage of B. [10]
4. Describe the field procedure of chain survey. [10]
5. What is two point problem ? Explain the above problem with neat sketch. [10]
6. The following offsets were taken from a chain line to a hedge : [10]

Distance in metre	0	10	20	30	40	60	80	100	120	140	160
Offset in metre	0	2	2.5	2.2	3	3.4	2.8	2.6	3.2	2.9	2.7

Calculate the area enclosed between the chain line and hedge by Simpson's rule.

7. A steel tape 30 m long standardised at 30 °C with a pull of 40 kg was used for measuring a base line. Find the correction per tape length if at the time of measurement the temperature was 52 °C and pull exerted 45 kg weight of steel per cubic centimetre equals 7.75 gm weight of tape 0.68 kg. $E = 2.11 \times 10^6 \text{ kg / cm}^2$, $a = 12 \times 10^{-6} \text{ per } ^\circ\text{C}$.

[10

8/15

MODEL – 5

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.

The figures in the right-hand margin indicate marks.

1. Answer *all* questions : [2 × 10 = 20
 - (a) Why well – conditioned triangles are preferred in chain surveying ?

- (b) How a reference sketch differs from index sketch ?
- (c) Mention the objective of tagging talies in chains.
- (d) Why chains are preferred over tapes in chain surveying ?
- (e) What is diurnal variation ?
- (f) What is the relationship between one hectare and acre ?
- (g) Explain orientation briefly.
- (h) Mention any four uses of a transit theodolite.
- (i) What is double meridian distance (DMD) ?
- (j) What do the term 'independent coordinate' mean ?
2. Answer any six questions. [5 × 6 = 30]
- (a) Explain the principle of a line ranger with neat sketch.
- (b) Explain the various sources of error in compass.
- (c) What is meant by folding and unfolding of chain ?
- (d) What is local attraction ? How it is detected ?
- (e) Mention the various errors and its precautions taken in a plane table surveying.
- (f) Explain the direct ranging and indirect ranging in chain survey.
- (g) Define W.C.B. and Q.B. in compass survey.
- (h) Examine whether a triangle having sides 156 m, 103 m and 256 m is well conditioned or not ?
3. A survey line BAC crosses a river, A and C being the near and opposite banks respectively. A perpendicular AD 50 m long is set at A. If the bearing of AD and DC are $35^{\circ} 45'$ and $280^{\circ} 30'$ respectively. Find the width of the river. [10]
4. What is three point problem ? Explain with neat sketches and procedures of solving the problem. [10]
5. The following fore bearing and back bearing were observed while traversing an area with a compass.
- | Line | FB | BB |
|------|-----------------------|-------------------|
| PQ | $44^{\circ} 30'$ | $226^{\circ} 30'$ |
| QR | $124^{\circ} 30'$ | $303^{\circ} 15'$ |
| RS | $181^{\circ} 0' 10''$ | |
| SP | $289^{\circ} 30'$ | $108^{\circ} 45'$ |
- At what station do you suspect local attraction ? Find corrected bearing of lines and also calculate all the interior angles of the traverse. [10]

SET - 1

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.

The figures in the right-hand margin indicate marks.

1. Answer all questions : [2 × 10 = 20]
- Why optical square is used in surveying ?
 - What is the principle of plane table surveying ?
 - Define a level surface.
 - Define line of collimation.
 - Define contour interval.
 - What is the difference between well conditioned triangle and ill conditioned triangle ?
 - Define isogonic and agonic lines.
 - What is local attraction and how it is detected ?
 - Name different types of chains, which are used in surveying.
 - Draw the conventional symbol of temple and level crossing.
2. Answer any six questions. [5 × 6 = 30]
- Explain the errors in chaining.
 - Explain how a chain is tested and adjusted in the field.
 - The bearings were observed during traversing $182^{\circ}35'$ and $126^{\circ}30'$. If the declination at the place is known to be $1^{\circ}40'$ E. Then find the bearings of the line.
 - What is orientation ? What are the methods of orientation and describes any one of them ?
 - What is "face left" and "face right" observation in angular measurement by a theodolite and why it is necessary ?
 - Find the included angles between lines AB and AC if their whole circle bearings are
 - AB $75^{\circ}30'$ and AC $108^{\circ}50'$
 - AB $185^{\circ}50'$ and AC $269^{\circ}25'$.

- Enlist and explain the function of each of the instruments required for plane table surveying.
 - Write short notes on any two :
 - Fore bearing and back bearing
 - Magnetic declination
 - Plane surveying and geodetic surveying.
3. The table below gives the length and bearings of the lines of traverse ABCDE, the length and bearing of EA having been omitted. Calculate the length and bearing of the line EA. [10]

Line	Length (m)	Bearings
AB	204.0	$87^{\circ}30'$
BC	226.0	$20^{\circ}20'$
CD	187.0	$280^{\circ}0'$
DE	192.0	$210^{\circ}3'$
EA	?	?

- State the advantages and disadvantages of plane table surveying. [10]
- Write down the procedure of temporary adjustment of level. [10]
- Explain how will you measure the horizontal angles by a theodolite by method of repetition and reiteration. [10]
- The following observations were made during the testing of a level : [10]

Instrument at	Staff reading at station	
	A	B
A	1.225	1.75
B	0.850	0.500

RL of station A is known to be 356.5. Calculate the RL of station B. Also calculate the error in line of collimation and state clearly whether it is inclined upwards or downwards.

(SET - 2)

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.

The figures in the right-hand margin indicate marks.

1. Answer all questions : $[2 \times 10 = 20]$
- (a) What is a field book? What kind of field book would you prefer and why?
 - (b) Write down the adjustment of chain.
 - (c) What do you mean by compass surveying?
 - (d) What are the principle of chain surveying?
 - (e) Draw the conventional symbols of chain line, Temple, building and boundary line.
 - (f) What is cadastral surveying?
 - (g) What is vertical circle in a theodolite?
 - (h) What is the least count of a transit theodolite?
 - (i) What is temporary bench mark?
 - (j) When would you apply resection method in plane table survey?
2. Answer any six questions. $[5 \times 6 = 30]$
- (a) An abstract form of a closed traverse is given below

Line	Length	Latitude	Departure
AB	80.0	+22.500	-68.450
BC	95.0	-81.755	-10.665
CD	53.0	-44.000	+15.550
DE	40.0	-12.250	+40.250
EA	125.0	+115.050	+23.315

Balance the traverse by Bowditch's rule.

- (b) Describe briefly the temporary adjustments of a theodolite.
- (c) What are the errors that may occur in plane table surveying?
- (d) Latitude and departure of lines of a closed traverse ABCD are as follows :

Line	Latitude		Departure	
	N	S	E	W
AB	200.8	-	110.5	-
BC	-	230.3	220.9	-
CD	-	150.7	-	88.4
DA	180.2	-	-	243.0

Calculate the area of the traverse by latitude and double meridian method. The sides are measured in mt.

- (e) A steel tape 20 m long, standardised at 15 °C with a pull of 10 kg was used to measure distance along a slope of 4°25'. If the mean temperature during measurement was 10°C and the pull applied 16 kg, determine the correction required per tape length. Assume co-efficient of expansion = 112×10^{-7} per °C, cross-sectional area of tape = 0.08 cm² and Young's Modulus E = 2.1×10^6 kg/cm².
 - (f) Find the combined correction for curvature and refraction for distance of (i) 3400 (ii) 1.29 km.
 - (g) The co-ordinates of point A are 100 (Northing) and 200 (Easting) and that of point B are 100 (Southing) and 300 (Easting). Find the length of survey line AB?
 - (h) Describe the method to measure magnetic bearing of a line.
3. A line was measured with steel tape 30m long standardised at 20°C with a pull of 150 N was used, the measured length being 1600 meter. The temperature at the time of measurement was 25°C and pull exerted was 170 N. Find the true length of the line if wt. of 1 cubic cm of steel is 0.08 N, wt. of the tape is 8 N. The coefficient of expansion of the material per 1°C = 3.5×10^{-6} and the modulus of elasticity of the material is 2.1×10^5 N/mm². $[10]$
4. The bearings observed at the stations of a closed traverse are given below. Check whether the bearings are correct. If not, correct the bearings. $[10]$
- | Line | F.B. | B.B. | DIFFERENCE |
|------|---------|---------|------------|
| AB | 122°15' | 302°15' | 180 |
| BC | 66°00' | 243°45' | 177°75' |
| CD | 308°15' | 133°00' | 175°15' |
| DA | 198°00' | 15°30' | 182°15' |

5 Write short notes on : [10]

- (i) Gales traverse table.
(ii) Curvature and refraction correction in levelling.

6. The following reading were taken in sequence during levelling work. [10]

1.505, 2.150 1.385, 1.890, 1.355, 2.115

1.955, 0.980 1.325, 1.175, 1.305 and 2.105.

The first reading was taken on a benchmark of 150 mt. Find the RLs of the remaining stations if the instrument was shifted after the 3rd, 7th and 10th reading. Use height of collimation method.

7. Find the area of closed traverse by calculation of area by co-ordinate method. [10]

Line	Latitude	Departure
AB	+ 225.5	+ 120.5
BC	- 245.0	+ 240.0
CD	- 180.5	- 140.5
DA	+ 200.00	- 220.0

SET - 3

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.
The figures in the right-hand margin indicate marks.

1. Answer all questions : [2 × 10 = 20]
- (a) Define latitude and departure of a survey line.
(b) Define Bench Mark.
(c) What does 'swinging the telescope' mean ?
(d) Define horizontal equivalent and contour interval.
(e) State the transit rule for balancing a closed traverse.
(f) State Simpson's rule.
(g) Define fore bearing and back bearing of a survey line.
(h) Draw the conventional symbols of church and railway crossing.
(i) The bearing of line AB and AE are 210° and 70° respectively. Calculate the interior angle A.

(j) Convert the following W.C.B. to Q.B. :

- (i) 160°25'
(ii) 285°50'
(iii) 15°45'
(iv) 203°30'

2. Answer any six questions. [5 × 6 = 30]

- (a) Write short notes about :
(i) Base line (ii) Check line
(iii) Offset (iv) Slope correction
(v) Leader and follower.
- (b) What are the obstacles in chaining ? Explain any one with neat sketch.
- (c) A surveyor measured the distance between two points on the plan drawn to a scale of 1 cm = 40 m and the result was 460 m. Later however he found that he used a scale of 1 cm = 20 m. Find the true distance between the points.
- (d) Describe the temporary adjustment of a Dumpy level.
- (e) What are the types of compass used in surveying ? Draw the neat sketch of a prismatic compass.
- (f) Write down the types of chain and tapes are used in surveying (with measurements).
- (g) Convert the following QB to WCB :
(i) QB of AB = S 36°30' W
(ii) QB of BC = S 43°30' E
(iii) QB of CD = N 26°45' E
(iv) QB of DE = N 40°15' W
(v) QB of EF = S 51°20' W
- (h) Explain the procedures for setting up plane table over a station.

3. The following are the observed bearings of the line a traverse ABCDEA. With a compass in a place where local attraction was suspected. [10]

Line	FB	BB
AB	191°55'	13°
BC	39°30'	222°30'
CD	22°15'	220°30'
DE	242°45'	62°45'
EA	330°15'	147°45'

Find out the correct bearings of the line.

4. A 20m steel tape was standardised on flat ground, at a temperature 20°C and under a pull of 15 kg. The tape was used in catenary at a temperature of 30°C and under a pull of 10 kg. The cross-sectional area of tape = 0.22 cm^2 and its total weight = 400 g, $E = 2.1 \times 10^6\text{ kg/cm}^2$ and $\alpha = 11 \times 10^{-6}/^{\circ}\text{C}$. Find the correct horizontal distance. [10]

5. Briefly explain about radiation and Inter-section method of plane table surveying? [10]

6. Write down the short notes (any two): [10]

- (i) Ranging
- (ii) Cross staff
- (iii) Optical square.

The following are the fore and back bearings of the sides of a closed traverse. Find out the included angles. [10]

Side	FB	BB
AB	$150^{\circ}15'$	$330^{\circ}15'$
BC	$20^{\circ}30'$	$200^{\circ}30'$
CD	$295^{\circ}45'$	$115^{\circ}45'$
DE	218°	38°
EA	$120^{\circ}30'$	$300^{\circ}30'$

SET - 4

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.
The figures in the right-hand margin indicate marks.

1. Answer all questions: [2 × 10 = 20]
- (a) Why two vernier readings are taken?
 - (b) Define "transiting".
 - (c) What is the use of Abney's level and pentagraph?
 - (d) Define "Height of Instrument" in levelling.
 - (e) What are the sources of error in chain surveying?
 - (f) What is telescope normal?
 - (g) What is meant by ranging of a line?
 - (h) How ranging rods are different from offset rods?
 - (i) What is meant by reconnaissance survey?
 - (j) Distinguish between suitability of radiation and intersection method.

2. Answer any six questions. [5 × 6 = 30]

(a) The following observations were made during the testing of a level.

Instrument at	Staff reading at station	
	A	B
A	1.225	1.375
B	0.850	0.500

RL of station A is known to be 356.5. Calculate the RL of station B. Also, calculate the error in line of collimation and state clearly whether it is inclined upwards or downwards.

- (b) Explain how you will measure the horizontal angles by a theodolite by repetition method.
- (c) List out the fundamental lines of a transit theodolite and indicate their significance.
- (d) Describe the process of measuring vertical angle by using theodolite.
- (e) In the measurement of a distance of 30 m, the careless leader holds the forward end of the chain at 1m too high and 1.1 m out of line. Calculate the error in each case and also total error.
- (f) Write Bowditch rule for balancing a traverse.
- (g) Distinguish between Rise fall method and height of instrument method.
- (h) Write down the different characteristics of contours.

3. What is two point problem? Explain the above problem with neat sketch. [10]

4. A line CAB crosses a river. A and B are on near and distant banks of the river respectively. Perpendiculars AD and CE are 30.5 m and 50.5 m respectively. Such that B, D and E are in a straight line. If the chainage of A is 550.5 m and AC = 45 m, then calculate the chainage of B. [10]

5. Describe the field procedure of chain survey. [10]

6. A steel tape 30 m long standardised at 30°C with a pull of 40 kg was used for measuring a base line. Find the correction per tape length if at the time of measurement the temperature was 52°C and pull exerted 45 kg weight of steel per cubic centimetre equals 7.75 gm weight of tape 0.68 kg, $E = 2.11 \times 10^6\text{ kg/cm}^2$, $\alpha = 12 \times 10^{-6}\text{ per }^{\circ}\text{C}$. [10]

7. The following offsets were taken from a chain line to a hedge : [10]

Distance in metre	0	10	20	30	40	60	80	100	120	140	160
Offset in metre	0	2	2.5	2.2	3	3.4	2.8	2.6	3.2	2.9	2.7

Calculate the area enclosed between the chain line and hedge by Simpson's rule.

SET - 5

(Theory - 3)

Full Marks - 80

Time - 3 Hours

Answer any five questions including Q. No. 1 & 2.

The figures in the right-hand margin indicate marks.

1. Answer all questions : [2 × 10 = 20]
- Why chains are preferred over tapes in chain surveying ?
 - What is diurnal variation ?
 - What is the relationship between one hectare and acre ?
 - Why well - conditioned triangles are preferred in chain surveying ?
 - How a reference sketch differs from index sketch ?
 - Mention the objective of tagging talies in chains.
 - What is double meridian distance (DMD) ?
 - What do the term 'independent coordinate' mean ?
 - Explain orientation briefly.
 - Mention any four uses of a transit theodolite.
2. Answer any six questions. [5 × 6 = 30]
- Define W.C.B. and Q.B. in compass survey.

- Examine whether a triangle having sides 156 m, 103 m and 256 m is well conditioned or not ?
 - What is local attraction ? How it is detected ?
 - Mention the various errors and its precautions taken in a plane table surveying.
 - Explain the direct ranging and indirect ranging in chain survey.
 - Explain the principle of a line ranger with neat sketch.
 - Explain the various sources of error in compass.
 - What is meant by folding and unfolding of chain ?
3. The following fore bearing and back bearing were observed while traversing an area with a compass.

Line	FB	BB
PQ	44°30'	226°30'
QR	124°30'	303°15'
RS	181°0'1°0'	
SP	289°30'	108°45'

At what station do you suspect local attraction ? Find corrected bearing of lines and also calculate all the interior angles of the traverse. [10]

4. The area of the plan of an old map plotted to a scale of 10 mt to 1 cm measures now as 100. 2 sq. Cm as measured by a planimeter. The plan is found to have shrunk so that a line originally 1-0 cm long now measures 9. 7 cm only. Further the 30 mt chain used is 8 cm too short. Find the true area of the survey. [10]
5. What are different methods of plane tabling ? Describe any one method in detail. [10]
6. A survey line BAC crosses a river. A and C being the near and opposite banks respectively A perpendicular AD 50 mt long is set at A. IF the bearing of AD and DC are 35° 45 and 280° 30' respectively. Find the width of the river. [10]
7. What is three point problem ? Explain with neat sketches and procedures of solving the problem. [10]