Code No: RR210104 **Set No.1**

II B.Tech. I Semester Supplementary Examinations, May -2005
SURVEYING-I
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Describe the different ways of measuring distance approximately.
   (b) A and B are two points 150m apart on the near bank of the river, which flows east and west. The bearings of the tree on the far banks as observed from A and B are N 50^0E and N 40^0W. Determine the width of the river.

2. (a) What is a traverse ? Explain the different types of traversing.
   (b) Convert the following whole circle bearings to quadrantal bearings.
      i. $350^012'$
      ii. $117^024'$
      iii. $68^051'$
      iv. $212^004'$

3. (a) What is meant by orientation. Explain the two methods of orienting the plane table.
   (b) List the advantages and disadvantages of plane table surveying.

4. (a) Explain why it is necessary to keep the level midway between backsight and foresight readings.
   (b) The following consecutive readings were taken with a Dumpy level. 6.21, 4.92, 6.12, 8.42, 9.1, 6.63, 7.91, 8.26, 9.71, 10.21.
   The level was shifted after 4^{th}, 6^{th} and 9^{th} readings. The R.L of first point was 125.00. Rule out of page of level field work and fill all the columns. Calculate the reduced levels and apply usual checks.

5. (a) What is indirect method of locating contours? Explain step by step procedure of locating contours by method of squares.
   (b) What do you mean by interpolation of contours? Explain arithmetical method of interpolation of contours

6. (a) List out different general methods of determining areas. Explain how the areas are computed by sub-division into triangles. What are the limitations of the method?
   (b) The following are the values in metres of the off sets taken from a chain to an irregular boundary.

Distance:	0	20	40	60	80	100	120	140	160
Offset:	3.5	5.1	6.7	6.2	5.4	6.9	7.4	6.4	5.8

   Calculate the area in square metres included between the chain line, the irregular boundary and the last offset by simpson's rule

7. (a) What are the different methods that are generally adopted for measuring volume. Explain them briefly.

   (b) Calculate the volume of earth work by prismoidal formula in a road embankment with the following date.

Chainage along the centre line in ft:	0	100	200	300	400
Ground Levels in formation :	201.7	202.9	202.4	204.7	206.9

   Formation level at chainage 0 is 202.3, top width 2.0 ft side slopes are 2 to 1. The longitudinal slope of the embankment is 1 in 100 rising. The ground is assumed to be level across the longitudinal section.

8. (a) List out permanent adjustments of a Sextant. Explain how adjustment of horizon glass and elimination of index error are carried out in case of Box Sextant.

   (b) Explain the principle and working of pantagraph with a neat sketch.

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Code No: RR210104 **Set No.2**

II B.Tech. I Semester Supplementary Examinations, May -2005
SURVEYING-I
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are the code of signals to be followed by surveyor ?
   (b) A survey line PQ intersects a hillock. In order to extend the line beyond this obstacle, a perpendicular QR, 100m long, is set out at Q. From R two lines RS and RT are st out at angles of 35^0 and 55^0 with RQ respectively. Find lengths RS and RT such that the points S and T may lie on the prolongation of line PQ and also find the obstructed distance QS.
2. (a) What is a meridian. Explain different meridians.
   (b) Under what circumstances is a compass traverse suitable.
   (c) What is closing error? How is it corrected?
3. (a) Explain the procedure of plane table surveying step by step.
   (b) List out different methods of plane tabling. Explain plane Table Radiation method along with neat sketches.
4. (a) Explain how reciprocal levelling eliminates the effect of atmospheric refraction and the earth curvature, as well as the effect of not adjusting the line of collimation.
   (b) A level sight on a staff held at a distance of 88 m from the instrument reads 2.375m and the bubble is found to be two divisions off the center of the run towards the staff. If the level tube is in adjustment and has a sensitivity of 40^0, what is the true reading on the staff? Take $sin1^0 = 1/206{,}265$
5. (a) Define contour, contour interval, horizontal equivalent.
   (b) Suggest some suitable values of contour interval for different scales of map and type of ground.
   (c) Explain the uses of contours
6. (a) What is Simpsons Rule in the computation of areas figures. Derive and expression for it.
   (b) The following offsets were taken from a chain line to a hedge. Calculate the area enclosed between the chain line and hedge by
      i. Simpsons Rule
      ii. Trapezoidal rule
7. (a) What are the different methods that are generally adopted for measuring volume. Explain them briefly.

(b) Calculate the volume of earth work by prismoidal formula in a road embankment with the following date.

Chainage along the centre line in ft:	0	100	200	300	400
Ground Levels in formation :	201.7	202.9	202.4	204.7	206.9

Formation level at chainage 0 is 202.3, top width 2.0 ft side slopes are 2 to 1. The longitudinal slope of the embankment is 1 in 100 rising. The ground is assumed to be level across the longitudinal section.

8. (a) How will you use a line ranger in the field. Explain with a neat sketch.

(b) Explain the principle of sextant. Prove mathematically that the angle of deviation of the reflected ray is twice the angle between the reflecting surfaces of the sextant.

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Code No: RR210104 **Set No.3**

II B.Tech. I Semester Supplementary Examinations, May -2005
SURVEYING-I
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Differentiate clearly between plane and geodetic surveying.
   (b) The distance between two points measured along a slope is 126m. Find the horizontal distance between them, if
      i. The angle of slope between the points is $60^0 30'$
      ii. The difference in level in 30m
      iii. The slope is 1 in 4.

2. (a) What is the closing error of a traverse? Show how it can be adjusted by graphical method.
   (b) What are the tests for the adjustment of a prismatic compass? How is the instrument adjusted.

3. (a) What is meant by orientation. Explain the two methods of orienting the plane table.
   (b) List the advantages and disadvantages of plane table surveying.

4. (a) What is meant by the reduction of levels ? Explain briefly the different methods.
   (b) Complete the following level-book and find the RLs of all stations including BM-A. Also apply the arithmetical check.

BS	IS	FS	Ht.of Coll	RL	Remarks
3.145					BM-A
	2.725				
0.975		1.855			
1.365		2.450			
	0.475				
2.805		2.405			
3.065		1.685			
1.500		1.400			
		2.750		512.000	BM-B

5. (a) Define contour, contour interval, horizontal equivalent.
   (b) Suggest some suitable values of contour interval for different scales of map and type of ground.
   (c) Explain the uses of contours

6. (a) Explain how the area of a land portion is determined from the field notes.

   (b) The following perpendicular offsets were taken from a chain line to a hedge.

Chainage (m)	0	20	40	60	80	100	120	140	160
Offsets (m)	6.7	7.8	9.7	11.8	9.6	8.8	7.6	6.9	6.2

   Calculate the area enclosed between the survey line, the hedge and the end offsets by

   i. Trapezoidal Rule

   ii. Simpsons Rule.

7. (a) A road at the formation level is 6m wide and has a side slope of 2:1. The road is to have a constant R.L. of 200m. The ground is level across the centerline of the road. The following observations were made.

Chainage (m):	0	20	40	60	80	100
Surface levels along C.L. of road:	204.6	203.0	200.8	201.6	202.0	200.2

   Estimate the volume of the earth work.

   (b) Find out the volume of earth work in a road cutting 120m long from the following data.
   The formation width is 10 metres. Side slopes 1 to 1.
   Average Depth of cutting along the centre of line = 5m; slope of ground in cross section 10 to 1

8. (a) Describe planimeter. Explain how you would use it in finding the area of a given figure. What precautions would you take in its manipulation.

   (b) Explain how Ceylon Ghat tracer is used to measure the slope between two given points of the ground.

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Code No: RR210104 **Set No.4**

II B.Tech. I Semester Supplementary Examinations, May -2005
SURVEYING-I
(Civil Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the methods of testing and adjusting of a chain. What are the prescribed tolerance limits?
   (b) If in a length of one chain along a slope, the ground rises 3m, find the angle of slope and the hypotenusal allowance per chain when it is
      i. 30m chain
      ii. 20m chain

2. The following bearings were observed in running a closed traverse.

Line	F.B	B.B
AB	S 40^0 30′ W	N $41^0$15′ E
BC	S 80^0 45′ W	N 79^0 30′ E
CD	N 19^0 30′ E	S 20^0 00′ W
DA	S 80^0 00′ E	N 80^0 00′ W

   At what stations do you suspect the local attraction? Determine the correct magnetic bearings. If declination was 5^0 10′ E, What are true bearings?

3. (a) What do you understand by the term plane table survey? When is it recommended?
   (b) Describe the various instruments used in plane Table survey. What are their functions?

4. (a) Describe the obstacles and difficulties that one comes across in levelling work.
   (b) Fill up the missing entries, marked (x).

Point	BS	1S	FS	Rise	Fall	RL	Remarks
1	3.125					(x)	BM-A
2	(x)		(x)	1.325		125.005	Change point
3		2.320			0.055		
4		(x)				125.350	
5	(x)		2.655				Change point
6	1.620		3.205				Change point
7		3.625			2.165		
8			(x)			122.590	BM-B

5. (a) Define contour, contour interval, horizontal equivalent.

(b) Suggest some suitable values of contour interval for different scales of map and type of ground.

(c) Explain the uses of contours

6. (a) The following perpendicular offsets were taken from a chain line to a hedge.

Chainage(m)	0	15	30	45	60	70	80	100	120	140
Offsets (m)	7.60	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

(b) The data of a closed traverse survey is shown below. Determine the area.

Line	Latitude(m)	Departure(m)
AB	-300	+450
BC	+640	+110
CD	+100	-380
DA	-440	-180

Calculate the area between the survey line, the hedge and the end offsets by Trapezoidal Rule and Simpson's Rule.

7. (a) In a certain railway cutting the width at formation level is 9m. The side of the cutting slope at 1 to 1 and the original ground surface has a side slope of 1 in 8. Determine the volume and cost of the cutting contained in a length of 240m, the average depth of cutting being 1.8m and its cost is Rs 50 per 100 cubic metres.

(b) Calculate the quantity of earth work in cubic metres required for a road embankment from the following data. Formation width = 9m; side slope 2 to 1.

Distance (m)	Height of bank(m)	Side slope of original ground
0	3.0	1 in 10
30	3.6	1 in 8
60	2.7	1 in 12

8. (a) What is meant by zero circle? Describe various methods of determining its area.

(b) What is a Box Sextant. How it is used for the measurement of Horizontal angle.

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