

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) I – Semester (Main) Examination, November / December 2012

Subject: Surveying – I

Time: 3 Hours

Max.Marks : 75

Note: Answer all questions from Part – A. Answer any five questions from Part – B.**PART – A (25 Marks)**

1. Write the details such as length and each link length of Revenue chain and Engineer's chain? (3)
2. If a 20 m chain diverges a perpendicular distance of 2 m from its correct alignment, determine the error length? (3)
3. Define isoclinic and isogonic lines related to compass surveying. (2)
4. A line AB had the magnetic bearing of $44^{\circ} 30'$ in 2000 when the declination was $1^{\circ} W$. Determine the magnetic bearing of the same line now, if the annual change was $5'$ Eastward. (3)
5. Determine displacement of a point on a plane table paper when in accurate centering was done. The conditions given as, scale of the map = $1/500$ and the point was 20 cm displaced in the direction perpendicular to the ray. (3)
6. Write a short note on errors in plane table survey? (2)
7. Draw and label components of a tilting level. (2)
8. Enumerate different types of levelling staffs and state the significance of target staff. (3)
9. Compare direct and indirect methods of contouring. (2)
10. Draw neat sketches of the below patterns of contours. (2)
 - (a) An over hanging cliff
 - (b) a saddle

PART – B (50 Marks)

- 11.(a) Explain the principles of chain surveying. (3)
- (b) A and B are two points 150 m apart on the near bank of a river which flows from east to west. The bearings of a tree on the far bank as observed from A and B are $N 50^{\circ} E$ and $N 43^{\circ} W$ respectively. Determine width of the river. (7)

12. The following fore and back bearings were observed in an open traverse (10)

Line	F.B.	B.B
1-2	$02^{\circ} 15'$	$182^{\circ} 15'$
2-3	$174^{\circ} 15'$	$354^{\circ} 00'$
3-4	$223^{\circ} 00'$	$42^{\circ} 45'$
4-5	$166^{\circ} 30'$	$346^{\circ} 45'$

Determine which of the stations are affected by local attraction and how much? Determine the true bearings of the lines if the magnetic declination in the survey area is $2^{\circ} 10' E$.

- 13.(a) What is three point problem? Describe stepwise the solution of the problem in the field by the Bessel's method. (6)
- (b) What do you understand by plane table contouring? (4)

14. The following is the page of a level field book from which several values are missing. Reconstruct the page and fill all the entries when X mark is present. Apply all necessary checks? (10)

Station	B.S.	I.S.	F.S.	Rise	Fall	R.L	Remark
1	1.385					100.00	B.M.
2		1.430			X	X	
3		X			0.395	X	
4		1.275				X	
5	0.630		0.585	X		X	TP ₁
6		0.920			X	100.13	
7		X			0.210	X	
8			1.740		X	X	

- 15.(a) A railway embankment is 8 m wide with side slopes of 15 to 1. The ground is level transversely. The centre heights at 30 m interval are 0.76, 1.25, 1.40, 1.78, 1.73, 1.22 and 0.20 m. Compute the volume contained in this reach by prismoidal formula. (6)
- (b) Explain the procedure for estimation of volumes of earthwork using contours. (4)
- 16.(a) Derive the trapezoidal rule with usual notations? (4)
- (b) Describe the distribution of closing error graphically by Bowditch's method. (6)
- 17.(a) Write the possible errors and their mitigation measures to be taken in levelling survey. (5)
- (b) Write a short note on reciprocal levelling and line of collimation error. (5)
