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Question Paper Code : 31002

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Third Semester

Civil Engineering

080100012 — SURVEYING — I

(Regulation 2008)

9.5.13 - AN

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define surveying.
2. Which type of area is best suited for chain survey? Give reasons.
3. What do you understand by closing error of a compass traverse?
4. Enumerate the instruments used in plane table survey.
5. Define axis of telescope and benchmark.
6. List out the characteristics of contours.
7. Discuss the permanent adjustment of a Theodolite.
8. Distinguish between consecutive co-ordinate and independent co-ordinates.
9. Write the procedure to set out the simple circular curves in the field.
10. What is the importance of transition curve?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss the various correction required for linear measurements. (6)
- (ii) A chain line PQR crosses a river, Q and R being on the near and distant banks respectively. A perpendicular QS, 100 m long is set out at Q on the left of the chain line. The respective bearings of R and P taken at S are $78^\circ 45' 10''$ and $168^\circ 45' 10''$. Find the chainage of R given the PQ is 45 m and the chainage of Q is 700 m. (10)

Or

- (b) (i) Discuss in details about direct ranging and indirect ranging. (5)
- (ii) List out the obstacles in chaining and how it can be overcome. (5)
- (iii) The distance measured between two points on a sloping ground is 450 m. Find the correction to be applied and the horizontal distance it. (3 × 2 = 6)
- (1) the angle of slope is 10° ,
- (2) the slope is 1 in 5
- (3) the difference in elevation between the two points is 45 m.
12. (a) (i) Distinguish between prismatic compass and surveyor's compass. (5)
- (ii) Convert the following quadrantal bearings to whole circle bearings.
- (1) N $30^\circ 30'$ E
- (2) S $70^\circ 45'$ E
- (3) S $37^\circ 38'$ W. (3 × 1 = 3)
- (iii) The bearings of the sides of a closed traverse ABCDEA are as follows :

Side	F, B	B.B
AB	$107^\circ 15'$	$287^\circ 15'$
BC	$22^\circ 00'$	$202^\circ 00'$
CD	$281^\circ 30'$	$101^\circ 30'$
DE	$181^\circ 15'$	$1^\circ 15'$
EA	$124^\circ 45'$	$304^\circ 45'$

Compute the interior angles of the traverse and exercise necessary checks. (8)

Or

- (b) (i) What are the various errors in plane table survey? (6)
- (ii) Explain the procedure for solving two point problem in plane table survey. (10)

13. (a) (i) What are the sources of error in levelling? List out the precautions required. (6)
- (ii) Determine the missing data. (10)

Station	B.S	J.S	F.S	Rise	Fall	H.J	R.L m
1	(?)						20.0
2		1.59		(?)			(?)
3	0.28		(?)		1.08	(?)	(?)
4	(?)		4.0		(?)	18.33	(?)
5		(?)			2.19		(?)
6		(?)		(?)			15.72
7			2.95		(?)		(?)

Or

- (b) (i) Describe the method of plotting contours by taking spot levels in the field. (6)
- (ii) The areas enclosed by contours in a lake and hill situated side by side in a plot of land are as under. (10)

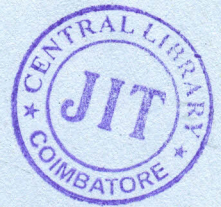
Lake	Contours (m)	200	190	180	170	160	150
	Area (m ²)	5000	3500	2000	1250	500	0.0
Hill	Contours (m)	200	210	220	230	240	250
	Area (m ²)	4500	3500	2250	1500	760	0.0

If the lake is to be filled upto 200 m level with the excavated material from the hill, ascertain whether excavated materials is just sufficient or in excess.

14. (a) (i) Describe to measure horizontal angles by reiteration method along with neat sketch and its table. (6)
- (ii) Determine the gradient from a point A to a point B from the following observations made with a fixed hair tachometer fitted with an anallatic lens the constant of the instrument being .100. (10)

	Bearing	Reading of studs hairs	Reading of axial hair	Vertical angle
To A	345°	0.750; 2.120	1.435	+15°
To B	75°	0.625; 3.050	1.835	+10°

Or



- (b) (i) Following table gives data of consecutive co-ordinates in respect to a closed theodolite traverse ABCDA

Stn	N	S	E	W
A	300.75			200.50
B	200.25		299.25	
C		299.00	199.75	
D		200.00		300.50

From the above data

Calculate the following :

- (1) Magnitude and direction of closing error
 - (2) Corrected consecutive co-ordinates of station B, using transit rule
 - (3) Independent co-ordinates of station B if those of A are (100, 100). (8)
- (ii) The lengths and bearings of a traverse ABCD are as follows :
- | Line | Length, m | Bearing |
|------|-----------|------------------|
| AB | 250.5 | $30^{\circ}15'$ |
| BC | 310.4 | $145^{\circ}30'$ |
| CD | 190.2 | $222^{\circ}15'$ |

Calculate the length and bearing of the line DA. (8)

15. (a) (i) Discuss the relationship between different parts of a compound curve. (8)
- (ii) A horizontal grade meets a -2.5% grade at 3035 m chainage and 218.905 m. elevation. A vertical curve of 16 m length with 4 m leg intervals is to be introduced. Calculate the necessary elevations on the curve. (8)

Or

- (b) (i) Two straights intersect at chainage 2056.44 m and the angle of intersection is 120° . If the radius of simple curve to be introduced is 600 m, Find the following :
- (1) Tangent distances
 - (2) Chainage of point of commencement
 - (3) Chainage of the point tangency
 - (4) Length of the chord. (10)
- (ii) Write short notes about
- (1) Sight distance
 - (2) Setting out building
 - (3) Reverse curve. (6)