[Total No. of Questions - 9] [Total No. of Printed Pages - 4]
(2123)

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B. Tech 3rd Semester Examination

Surveying-I (N.S.)

CE-214

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : (i) There are Nine questions in five parts of this paper. All questions carry equal mark.
(ii) Attempt FIVE questions carrying at-least one from each part. Question nine is compulsory.
(iii) Assume any missing data.

SECTION - A

1. (a) A base line is measured with steel tape. Its length is approx. 1000 m. Calculate correct length of base line at MSL when the standard pull was 15 Kg and applied pull=23 Kg. Cross-sectional area of the tape =0.0645 cm^2, E=2.11×10^6 kg/cm^2, mean and standard temperature is = 35 and 15 degree centigrade respectively. The difference of level between two ends of the base line is 2.0 m and radius of earth=6400 km. **(10)**

   (b) Write about fundamental principal of surveying. **(5)**

   (c) Explain about various duties of a surveyor. **(5)**

2. (a) Explain briefly about various kind of errors. **(5)**

   (b) Write about hypotenusal allowance. Derive suitable relationship for it. **(5)**

   (c) A survey line BAC crosses a river, A and C being on the near and distant banks. Standing at D, a point 50 m perpendicular to AB from A, the bearing of C and B are 320° and 230°. AB = 25 m. Find width of river. **(10)**

SECTION - B

3. (a) Explain a prismatic compass with a neat sketch showing various parts. **(10)**

   (b) Calculate the correct bearings after adjusting local attraction and included angles from the following data.

Line	Fore bearing	Back Bearing
AB	80º10'	259° 0'
BC	120°20'	301°50'
CD	170°50'	350°50'
DE	230°10'	49°30'
EA	310°20'	130°15'

(10)

4. (a) Explain various method of traverse adjustment in detail. **(10)**

   (b) Following observations were obtained with a theodolite traverse, Determine length of CD and bearing of DE.

Line	Length	Bearing
AB	281.4	S69°11'E
BC	129.4	N21°9'E
CD	?	N19°34'W
DE	144.5	?
EA	168.7	S74°24'W

(10)

SECTION - C

5. (a) Following staff reading were observed with a 4 m staff on a continuously sloping ground at an interval of 15 m:

   0.88, 1.635, 2.055, 2.53, 3.085, 3.58, 1.255, 2.06, 2.465, 3.74, 1.035, 1.145, 1.73, 2.646.

   The RL of first point is 780.15 m. Enter all observations on a page of level book and calculate reduced levels of each point by rise and fall method and gradient of the line joining the first and last point. **(10)**

   (b) Explain about how a contour map can be used to determine visibility between two points and laying grade contour on a map in office. **(10)**

6. (a) Write about contour interval and the points on which contour interval depends in details. **(10)**

(b) A grade of 1/400 falling from elevation 67.45m was set out by driving pegs at 100 m intervals with the top of the pegs on the required elevations. After some time it was suspected that some of the pegs have been disturbed and the following observations were taken for checking their levels. Find out the errors for each peg. **(10)**

Sr.	BS	IS	FS	RL	Remarks
1	1.76			64.13	BM
2	2.64		0.72		
3	1.96		1.42		
4		0.93			Peg1
5		1.2			Peg2
6		1.5			Peg3
7		1.76			Peg4
8		2.03			Peg5
9		2.3			Peg6
10	0.69		2.59		Peg7
11		0.95			Peg8
12		1.23			Peg9
13		1.52			Peg 10
14	0.61		1.21		
15			1.72	64.13	BM

SECTION - D

7. (a) Calculate distance and bearing of line CD, and RL of C and D, if RL of A = 1020.60 m and B = 1021.21 m from following data using a vertically held staff:

station	H.I.	coordinates		Staff	Bearing	Vertical	Staff reading		
		N	E			angle	lower	middle	upper
A	1.50	800	1800	C	15º14'	8º9'	1.10	1.85	2.60
B	1.53	950	2500	D	340º18'	2º3'	1.32	1.91	2.50

(10)

(b) Explain Bessels's graphical method of plane table surveying. **(10)**

8. (a) Derive a relationship to determine area by Simpson's one-third rule. **(10)**

(b) Following table provide latitude and departure of the sides of closed traverse ABCD. **(10)**

Side	Lattitude	departure
AB	108	4
BC	15	249
CD	–123	4
DA	0	–257

Compute the area by DMD method.

SECTION - E

9. (a) Explain briefly Indian pattern clinometers.

(b) Derive a relationship of determining reduced level of a point using tangential method of tacheometry for elevation angle.

(c) Write trapezoidal and prismoidal formula of calculating volume.

(d) What is reciprocal leveling? Write about the reasons of carrying out reciprocal levelling.

(e) What is the difference between rise and fall method and height of instrument method of finding reduced level.

(f) Define precision and accuracy.

(g) Write about indirect ranging method when both stations are not visible from intermediate stations.

(h) Define magnetic declination and write point's affecting magnetic declination.

(i) Explain how a theodolite is leveled?

(j) What is normal tension? Write the equation to calculate normal tension. **(2×10=20)**