[Total No. of Questions - 9] [Total No. of Printed Pages - 4]
(2126)

16042(D) - 0 DEC 2016

B. Tech 3rd Semester Examination

Surveying (NS)

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) Attempt five question carrying at least one from each section. Question no. 9 is compulsory.
(ii) Support your answer with neat sketches wherever necessary.

SECTION - A

1. (a) Describe the classification of survey, based on the instruments used. (5)

   (b) With the help of neat sketch describe the necessity and method of indirect ranging. (5)

   (c) A piece of ground was measured with an incorrect chain. The area of the plot as got from the drawings is 1600 sq.cm. The scale of the drawing being 10 meter=1cm. Find the corrected area of the piece of ground if the correct length of the chain is 30.1 meter. (10)

2. (a) Describe any two units of angular measurements. (5)

   (b) Draw a typical neat sketch of a metric chain and mark the different parts. (5)

   (c) Determine the sag correction for a 30m steel tape under a pull of 80N in 3 bays of 10m each. The area of cross section of the tape is 8 mm^2 and the unit weight of steel is 77 kN/mm^3. (10)

SECTION - B

3. (a) Draw the neat sketches of the scales of prismatic compass and surveyors compass and show the marking on them. (6)

   (b) Differentiate between method of repetitions and reiteration in theodolite survey. (4)

   (c) Calculate latitudes, departures and closing error for the following traverse and adjust using Bowditch's rule.

Line	Length (m)	W.C.B.
AB	89.31	45°10'
BC	219.76	72°05'
CD	151.18	161°52'
DE	159.10	228°43'
EA	232.26	300°42'

(10)

4. (a) Differentiate between "traversing by method of deflection angle" and "traversing by method of direct angle." (5)

   (b) Draw a page of Theodolite observation field book and label all the columns. (5)

   (c) The bearing of the diagonal (AC) of a square ABCD is 35°30'. Find the bearing of the other diagonal BD and all the lines. (10)

SECTION - C

5. (a) Describe the term "turning point" and its importance in levelling. (5)

   (b) Describe the typical characteristics of contours. (5)

   (c) The following readings were taken at intervals of 100m in levelling along the alignment for a proposed road.

   1.21, 1.40, 2.71, 3.41, 3.81, 1.17, 3.07, 3.70, 1.71, 1.33, 3.37, 3.04, 2.10 and 1.15.

   The foresights were 5th, 10th and 14th reading. RL of the first point was 258.42m.

   Draw of up the level book record for this work. Determine RLs of all the points and apply the usual check. (10)

6. (a) Differentiate between "profile levelling" and "reciprocal levelling". (5)

[P.T.O.]

(b) Describe the terms "Contour interval" and factors affecting the selection of contour interval. (5)

(c) Find out the missing figures and complete the level book page. Apply usual arithmetic check.

B.S.	I.S.	F.S.	H.I.	R.L.	Remarks
4.390			?	?	Point 1
	?			192.00	Point 2
3.910		6.520	?	?	Point 3
	5.390			191.620	B.M.
	4.730			?	Point 4
	?			203.300	Point 5 Staff inverted
4.330		?	?	?	Point 6
		2.990		194.830	Point 7

(10)

SECTION - D

7. (a) Describe the limitation of using "three point problem" in plane table survey and name any four methods of solving three point problem. (5)

(b) Describe the subtense bar method of tacheometry. (5)

(c) Determine the gradient from a point P to another point Q from the following observations made with a techeometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertical.

Instrument station	Staff station	Bearing	Vertical angle	Staff readings
R	P	130°	+10°32'	1.255 1.810 2.365
	Q	220°	+5°06'	1.300 2.120 2.940

(10)

8. (a) Write a short note on self reduction tacheometer. (5)

(b) Describe the terms centering and orientation in plane table survey and highlight their necessity. (5)

(c) The latitude and departures of the lines of a closed traverse ABCD area given below. Calculate the area of the traverse by DMD method.

Line	North (m)	South (m)	East (m)	West (m)
AB	–	164.5	162.1	–
BC	217.8	–	59.8	–
CD	168.1	–	–	105.6
DA	–	221.4	–	116.3

(10)

SECTION - E (Compulsory)

9. Answer the following in brief and to the point.

(a) Differentiate between "level line" and "horizontal line".

(b) Describe the term "significant figure" in accuracy.

(c) Differentiate between "deflection angle" and "interior angle". Give the neat sketch.

(d) Describe the term "Back sight", "Fore Sight" and "Intermediate Sight" in levelling.

(e) Write "Prismoidal formula" for calculation of volume and describe it.

(f) "Compensating errors" and "Cumulative errors" differentiate them.

(g) Advantages of using staff vertical as compared to staff normal.

(h) What types of errors could be eliminated by taking both face observations in Theodolite survey?

(i) Describe the term "sensitivity of bubble tube".

(j) Describe the term "curvature error" in levelling.

(2×10=20)