BCET-303

Roll No. | 6 | 9 | 1 | 1 | 9 | 0 | 1 | 0 | 7 | 0 | 07 |

Odd Semester Examination, 2019-20

B. Tech: Civil (3rd Semester)

Surveying

Time: 3:00 hrs. **Max. Marks: 100**

Total no. of printed pages: 2

Note : (i) All questions are compulsory.

(ii) In case of numerical problems assume data whenever not provided.

Q1. Attempt any four of the following **4X5=20**

(a) Explain the following terms in brief.
Hour Angle & Right Assenssion, Declination angle & Polar Distance and Altitude & Zenith Distance

(b) A line of levels was run from a Bench Mark of RL 51.450 m and ended on a BM of 63.500 m. The sum of the back sights and fore sights was 87.755 and 73.725 respectively. What was the closing error of the work?

(c) What do you mean by Astronomical Survey? Define the relationship between coordinates.

(d) What do you mean by Contour? Define Characteristics of contour line.

(e) What do you mean ideal transition curve? Define different method to find out length of transition curve.

(f) What do you mean by surveying? As a civil engineer, define the survey work for road and building construction site

Q2. Attempt any four of the following **4X5=20**

(a) Write a short note on:-
Plotting L section and cross section, Curvature, refraction and combined correction.

(b) Elevation of two triangulation stations A and B, 50Km apart 243 m and 258m respectively, the intervening may be assumed to have a uniform elevation of 216m. Find the minimum height of signal required at B, so that the line of sight may not pass nearer the ground than 2.4 m.

(c) A closed traverse has the following length and bearings:

Line	Length	Bearing
AB	200.0 m	?
BC	98.0 m	178^0
CD	X	270^0
DA	86.4 m	1^0

(d) The following are the observed values of an angle and their weightage:

Angle	Weightage
$30^0 24' 20''$	2
$30^0 24' 18''$	2
$30^0 24' 19''$	3

(i) Probable error of single observation of unit weight.
(ii) Probable error of weighted arithmetic mean.
(iii) Probable error of single observation of weight 3.

(e) What is the function of Total station and EDM? Define different type of EDM used in surveying work.

(f) Explain law of weight with suitable example. Explain procedure of adjustment of triangle with central station.

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Q3. Attempt any two of the following **2x10=20**

(a) The following reading was noted in a closed traverse:

Line	AB	BC	CD	DE	EA
FB	32^0	77^0	112^0	122^0	265^0
BB	212^0	262^0	287^0	302^0	85^0

At which stations do you suspect local attraction? Find correct bearing of lines? What will be the true for bearings (as reduced bearing) of lines, if the magnetic declination was 12^0W? Define a bench mark. What are the different kinds?

(b) The field level book readings from a fly level are as follows.

Staff station	RL	BS	FS
BM-1	100	3.635	-
A	X	X	2.375
B	104.150	4.220	1.030
C	106.650	3.990	X
BM-2	108.000	X	X

Find out the missing value marked(X) and perform the arithmetic checks.

(c) Differentiate between two.
"Three point problem" and "two point problem",
"Whole to part" and "part to whole",
"Rise, fall, and line of collimation method",
"Triangulation "and "Trilitration",
"Reciprocal leveling" and "profile leveling" and
"Contour interval" and "Horizontal Equivalent"

Q4. Attempt any two of the following **2x10=20**

(a) To find out the included angles in a closed survey PQRSTP, the following observations were made with the compass. Calculate the included angles after correcting for local attractions.

line	Fore bearing	Back bearing
PQ	$N62^0 45' E$	$S62^0 15' W$
QR	$N21^0 00' W$	$S20^0 45' E$
RS	$N71^0 30' W$	$S71^0 30' E$
ST	$S39^0 00' W$	$N38^0 00' E$
TP	$S54^0 30' E$	$N53^0 15' W$

(b) Determine the azimuth and latitude of a star from the following data.
Declination of star = $20^0 30' N$
Hour Angle of star = $42^0 6'$
Latitude of observer = $50^0 N$

(c) What is different method used for setting out of simple circular curve? Define Rankine method with proper figure.

Q5. Attempt any two of the following **2x10=20**

(a) Calculate the data required for setting out vertical curve for given data:-
(i) Two grades; +0.6% and -0.6%
(ii) Chainage of intersection point = 630 m
(iii) RL of intersection point = 355.50 m
(iv) The rate of change of grade is 0.1% per 30m.

(b) Two tangents intersect at a chainage of 1125.50mwith 26 degree deflection. Calculate the data required for setting out a curve of radius 300m. (i)Tangent length (ii) length of long chord (iii) length of the curve (iv) chainage of tangent points (v) Mid ordinate or versed sine of curve.

(c) Two straight lines AB and BC intersect at appoint B of chainage 1100m. to avoid an obstacle, another line PQ is taken to connect AB and BC, so that $<APQ = 140^0$ and $<PQC = 155^0$ .the radius of the first arc is 400m and that of second is 300m. Calculate the chainage of (i) tangent points and (ii) point of compound curvature.