Time: 3-hour   **Max. Marks: 80**

N. B. 1) Question No. 1 is compulsory
       2) Attempt any three questions out of remaining questions
       3) Assume suitable data if needed and state it clearly

Q1   Attempt any four of the following   **5 marks each**

A   Explain the method of measuring horizontal angle between the two points.
B   Define contour ,contour interval and horizontal equivalents.
C   Explain different uses of total station.
D   Enlist and mention the function of each of the instrument required for plane table surveying

E   A 20 m chain was found to be 8 cm too long after chaining 1730m. It was 10 cm too long at the end of day work after chaining a total distance of 2880m. If the chain was correct before commencement of the work, find the true distance.

Q2   **10 marks each**

A   The staff readings taken along a leveling operations are given below. The instrument was shifted after taking 5th, 10th, 14th and 19th readings. Arrange the data in tabular form and find the R.L. of all the points by rise and fall method if the 12th reading was taken to a BM of R.L. 185.635.
1.355, 1.605, 2.125, 0.685, 1.365, 2.015, 1.355, -1.385, 0.685, 2.105, 1.685, 1.155, 1.105, 2.015, 1.085, 1.345, 1.355, -2.015, 1.305, 1.655, 1.685 and 1.455.

B   The following bearings was taken while conducting a close traverse with a compass in a place where local attraction was suspected. At what stations do you suspect local attraction? Find the included angles, the corrected bearings for local attraction and for declination of 10°W calculate true bearings.

Line	FB	BB
AB	$36^{o}00$'	$216^{o}45$'
BC	$98^{o}15$'	276°
CD	$201^{o}45$'	$23^{o}15$'
DA	$322^{o}45$'	$142^{o}45$'

Q3
A   Attempt the following questions   **5 marks each**
i.   Explain use of planimeter.
ii. Explain any two types of leveling

B   **10 marks**
In Traverse ABCDE the following lengths and bearings were recorded. Calculate the missing length and bearing of line EA.

Line	length	W.C.B.
AB	204	$87^{0}30$'
BC	226	$20^{0}20$'
CD	187	280^{0}
DE	192	$210^{0}50$'
EA	?	?

Q4 A   Attempt the following questions   **5 marks each**

  i   Enlist various application of GPS in surveying

  ii   Write short note on temporary adjustment of theodolite.

  B   Two straights meet at an intersection angle 126^0 48' and chainage 1190 m. These
straights are to be joined by circular curve of radius 300 m. Calculate the necessary data
for setting out curve by method of offset from long chord.   **10 marks**

Q 5   Attempt the following questions   **10 marks each**

  A   Determine The following observations were taken with tacheometer fitted with an
anallatic lens, the staff being held vertically. The constant of the tacheometer is 100.
Calculate the RL of B and the distance between A and B.

Inst.St.	Staff station	Height of Instrument	Vertical angle	Staff readings	
P	BM	1.255	-4° 20'	1.325,1.825,2.325	RL OF BM
	A	1.255	$+6^O30'$	0.850,1.600,2.350	= 255.750 m
B	A	1.450	-7^0 24'	1.715,2.315,2.915	

  B   The offsets (in m) taken from a chain line to a curved boundary are given below

Ch.	0	5	10	15	20	25	35	45	55	65
Offsets	2.5	3.8	8.4	7.5	10.5	9.3	5.8	7.8	6.9	8.4

Find the area between chain line, the first and last coordinate and the boundary by
   1) Trapezoidal rule 2) Simpson's rule

Q 6   Attempt the following questions   **10marks each**

  A   Explain in detail block contouring project.

  B   Describe the field procedure of setting out a simple circular curve by Rankine's method.

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