KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2022

(Regulation 2018)

Third Semester

CIVIL ENGINEERING

U18CEI3202**:** ENGINEERING SURVEY

COURSE OUTCOMES

CO1:   Carry out area and volume measurements for the given land.
CO2:   perform angular measurement, elevation and distance of an object.
CO3:   Set out the curves
CO4:   Conduct survey works using total station
CO5:   Apply the concepts of satellite and characteristics of different platforms of GPS surveying

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1. Convert the following Reduced Bearing (RB) to Whole Circle Bearing (WCB). a) N65ºE b) S43º15'E c) S52º30'W d) N32º42'W	CO1	[K2]
2. Distinguish between plane and geodetic surveying	CO1	[K2]
3. Mention the advantages and disadvantages of fitting an anallatic lens in tacheometer	CO2	[K2]
4. Show the cases by which the difference in elevation between the instrument station and the object under observation can be measured.	CO2	[K2]
5. Find the combined correction for curvature and refraction for 2400 mts	CO3	[K2]
6. Enlist the instruments used for hydrographic surveying.	CO3	[K2]
7. Enumerate the temporary adjustments in Total station.	CO4	[K2]
8. Distinguish between triangulation and Trilateration	CO4	[K2]
9. While using GPS for surveying in a hill region, there is weak signal, despite availability of signal transmission towers. What would be the reason for it?	CO5	[K2]
10. Enlist the various segments in GPS	CO5	[K2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11. a) The following consecutive readings were taken with a level and 5-meter levelling staff on continuously sloping ground at a common interval of 20 meter: 0.385;	8	CO1 [K3]

1.030; 1.925; 2.825; 3.730; 4.685; 0.652; 2.005; 3.110; 4.485. The reduced level of the first point was 208.125m. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the points by raise and fall method and also the gradient of the line joining the first and last point.

b) The following bearings were observed in running a closed traverse. 8 CO1 [K4]

Line	F.B.	B.B.
AB	71°05'	250°20'
BC	110°20'	292°35'
CD	161°35'	341°45'
DE	220°50'	40°05'
EA	300°50'	121°10'

Determine the correct magnetic bearings of the lines.

12. a) The top (Q) of a chimney was sighted from two stations P and R at very different levels, the stations P and R being in line with the top of the chimney. The angles of elevation from P to the top of the chimney was 38o21' and that from R to the top of the chimney was 21o18'. The angle of the elevation from R to a vane 2m above the foot of the staff held at P was 15o11'. The heights of instrument at P and R were 1.87m and 1.64m respectively. The horizontal distance between P and R was 127m and the reduced level of R was 112.78m. Find the R.L. of the top of the chimney and the horizontal distance from P to the chimney. 8 CO2 [K3]

b) The elevation of a point P is to be determined by observations from two adjacent stations of a tacheometric survey. The staff was held vertically upon the point, and the instrument is fitted within an anallactic lens, the constant of the instrument being 100. Compute the elevation of the point P from the following data, taking both the observations as equally trustworthy: 8 CO2 [K3]

Instrument station	Height of axis	Staff point	Vertical angle	Staff readings	Elevation of station
A	1.42	P	(+) 2°24'	1.230, 2.055, 2.880	77.75m
B	1.4	P	(-) 3°36'	0.785, 1.800, 2.815	97.135m

Also, calculate the distance of A and B from P.

13.	a)	Calculate the various elements of a simple circular curve of radius 300m connecting two straights intersects at an angle of 120	8	CO3	[K$_3$]
	b)	Explain different methods of locating soundings	8	CO3	[K$_2$]
14.	a)	Explain basic principle and classification of Total Station with advantages	8	CO4	[K$_2$]
	b)	Illustrate the parts of total station with neat a sketch	8	CO4	[K$_2$]
15.	a)	Explain the various segments comprising the functioning of GPS with neat sketches	8	CO5	[K$_2$]
	b)	Write short notes on, (i) Photogrammetry (ii) Remote Sensing	8	CO5	[K$_2$]
16.	a)	The following perpendicular offsets were taken from a chain line to a hedge:	8	CO1	[K$_3$]

Chainage (m)	0	15	30	45	60	70	80	100	120	140
Offsets (m)	7.6	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4

Calculate the area between the survey line, the edge, and the end offsets by

i) Trapezoidal rule

ii) Simpson's rule.

	b)	In a harbor development scheme at the mouth of a tidal river, it has been found necessary to take soundings in order to buoy the navigation channel. Explain clearly how you would determine the levels of point on the riverbed and fix positions of the soundings.	8	CO3	[K$_4$]

i) by use of sextant in a boat

ii) by use of the theodolite on the shore.

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