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Code No. : 13116

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (Civil Engg.: CBCS) III-Semester Main Examinations, December-2018**

**Surveying-I**

Time: 3 hours

Max. Marks: 60

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

Q.No.	Stem of the question	M	L	CO	PO																		
<b>Part-A (10 × 2 = 20 Marks)</b>																							
1.	Suppose you are asked to conduct a chain survey in a crowded town. What would you answer to the above proposal?	2	2	1	1,5,6																		
2.	If the whole circle bearing of the line is $170^{\circ}12'$ , determine the quadrantal bearing?	2	3	1	1																		
3.	One month after the completion of a plane table survey, it is detected that an important object was not plotted. How will you plot the object on going to the field?	2	2	2	1,5																		
4.	Which method is used to locate inaccessible points in plane table surveying? Draw a sketch of plotting any three inaccessible points in the field using that method.	2	2	2	1,5																		
5.	In some places consecutive contours run close together and in some places they are wide apart. What does this mean?	2	2	3	1,5																		
6.	A line of level was run in the form of a loop 600.00 m long. The initial elevation of the starting point was 29.0 m. When the last foresight reading of 3.005 m was made on the starting point, the height of instrument was 32.0 m. Compute the closing error.	2	3	3	1																		
7.	State Trapezoidal and Simpson's one third rule for determination of area from offsets.	2	2	4	1																		
8.	Draw the various cross sections used for determination of volumes with standard notations.	2	2	4	1,5																		
9.	What do the terms "consecutive coordinates" and "independent coordinates" mean?	2	2	5	1																		
10.	If horizontal angle, zenith angle and slope distance are the basic parameters measured in the total station, how do you determine the elevation of the ground beneath the reflector?	2	2	5	1,5																		
<b>Part-B (5 × 8 = 40 Marks)</b>																							
11. a)	A compass traverse ABCDEA was run anticlockwise and the following bearings were taken where local attraction was suspected.	5	3	1	1,2,5																		
	<table border="1"> <thead> <tr> <th>Line</th> <th>FB</th> <th>BB</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td><math>150^{\circ}0'</math></td> <td><math>329^{\circ}45'</math></td> </tr> <tr> <td>BC</td> <td><math>77^{\circ}30'</math></td> <td><math>256^{\circ}0'</math></td> </tr> <tr> <td>CD</td> <td><math>41^{\circ}30'</math></td> <td><math>222^{\circ}45'</math></td> </tr> <tr> <td>DE</td> <td><math>314^{\circ}15'</math></td> <td><math>134^{\circ}45'</math></td> </tr> <tr> <td>EA</td> <td><math>220^{\circ}15'</math></td> <td><math>40^{\circ}15'</math></td> </tr> </tbody> </table>	Line	FB	BB	AB	$150^{\circ}0'$	$329^{\circ}45'$	BC	$77^{\circ}30'$	$256^{\circ}0'$	CD	$41^{\circ}30'$	$222^{\circ}45'$	DE	$314^{\circ}15'$	$134^{\circ}45'$	EA	$220^{\circ}15'$	$40^{\circ}15'$				
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	At what stations do you suspect local attraction? Find the corrected bearings for local attraction and for declination of $10^{\circ}30'W$ .																						

Contd...2



- b) Two stations A and B are not intervisible due to rising ground between them. Explain with a sketch how the line AB can be ranged if both the stations are visible from intermediate points 3 2
12. a) What is a three point problem? Describe how it is solved by Bessel's method. 4 2 2
- b) Explain with a neat sketch the procedure of solving a two-point problem in plane table surveying. 4 2 2
13. a) The following consecutive readings were taken with a level and a 4 metre levelling staff on a continuously sloping ground at common intervals of 30m.: 0.855 (on A), 1.545 m, 2.335, 3.115, 3.825, 0.455, 1.380, 2.055, 2.855, 3.455, 0.585, 1.015, 1.850, 2.755, 3.845 (on B). The RL of A was 380.500. Make entries in a level book and apply the usual checks. Determine the gradient of AB 6 3 3 1,2,5
- b) What considerations would you have while selecting the contour interval? 2 2 3 1,5
14. a) The coordinates of the corners of an area of tract are given below. Determine the area. 4 3 4 1,2,5

Point	X	Y
A	1000 m	1000 m
B	1150 m	850 m
C	1650 m	780 m
D	2000 m	1050 m
E	1700 m	1350 m
F	1300 m	1530 m
G	900 m	1150 m

- b) The following are the data corresponding to an irregular cross section. The width of the road at formation level is 6m. The side slope is 1:1. The station are taken at 50 m interval 4 3 4 1,2,5

Station	Left		Center	Right	
1	+ 2.20 5.50	+ 1.75 3.00	+ 1.50 0	+ 4.75 5.25	+ 6.40 7.30
2	+ 3.10 5.25	+ 2.20 3.00	+ 2.00 0	+ 5.25 6.00	+ 7.40 8.50

Calculate the volume of earthwork.

15. a) While traversing a closed traverse, due to the obstructions it was not possible to observe the bearings of lines BC and CD. Calculate the missing bearings. 6 3 5 1,2,5

Line	Length (m)	W.C.B.
AB	550	60°
BC	1200	?
CD	880	?
DA	1050	310°

- b) Describe how total station has brought revolution in surveying. 2 2 5 1,5,6
16. a) What are the basic principles of surveying? Explain briefly the basic method of fixing positions in the horizontal plane. 4 2 1 1,5
- b) What are different types of plane tables? Describe in detail the various accessories of plane table surveying. Also, explain the procedure for setting up a plane table over a station. 4 2 2 1,5



17. Answer any *two* of the following:

a) Two points A and B are on the opposite banks of the wide river. The following observations were taken in reciprocal levelling

4 3 3 1,2,5

Instrument at	Staff reading at	
	A	B
A	1.625	2.545
B	0.725	1.405

Determine RL of B if that of A is 100.105. Also calculate the angular error in collimation if the distance between A and B is 1100m.

b) The following offsets were taken from a chain line to a hedge

4 3 4 1,2,5

Distance (m)	0	20	40	60	80	120	160	220	280
Offset (m)	9.4	10.8	13.6	11.2	9.6	8.4	7.5	6.3	4.6

Compute the area included between the chain line, hedge and the offset by Simpson's rule.

c) What is the principle of EDM instruments? What are the different types of EDM? If the coordinates of the total station are  $(I_E, I_N, I_Z)$  and the horizontal distance between total station and reflector is  $h$ , horizontal angle measured in a clockwise sense from instrument north is  $\phi$ , zenith angle being  $\alpha$ , slope distance  $S_D$ , determine the coordinates of the ground under the reflector  $(R_E, R_N, R_Z)$ .

4 3 5 1,5

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	49
2	Knowledge on application and analysis (Level-3 & 4)	51
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	---

