Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

IV SEMESTER B.TECH (CIVIL) END SEMESTER EXAMINATIONS
MAY 2019
SUBJECT: APPLIED SURVEYING [CIE 2204]

Date of Exam: **/05/2019** Time of Exam: **9:00 AM to 12 NOON** Max. Marks: **50**

Instructions to Candidates:

- Answer ALL the questions & missing data may be suitably assumed

<table>
<tr><td>1A.</td><td>The following observations were made using a tacheometer fitted with an anallactic lens.
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<tr><th>Inst. station</th><th>H.I.</th><th>Staff station</th><th>WCB</th><th>Vertical angle</th><th>Hair readings</th><th>Remark</th></tr>
<tr><td>P</td><td>1.550</td><td>A</td><td>$30^0 30'$</td><td>$4^0\ 30'$</td><td>1.155,1.755,2.355</td><td rowspan="2">RL of O =150.000</td></tr>
<tr><td></td><td></td><td>B</td><td>$75^0 30'$</td><td>$10^0\ 15'$</td><td>1.250,2.000,2.750</td></tr>
</table>
Calculate the distance AB and the RLs of A and B. Find also the gradient of the line AB.</td><td>6</td><td>CO1</td></tr>
<tr><td>1B.</td><td>With neat sketch derive distance equation for horizontal line of sight and staff vertical in fixed hair method.</td><td>4</td><td>CO1</td></tr>
<tr><td>2A.</td><td>The image ‘x’ and ‘y’ of the base and top respectively of a factory chimney 150m high are observed in a truly vertical aerial photograph of scale 1:10000. Determine the position of ‘x’ given that y is 70mm from principal point of the photograph. Take focal length of the camera to be 125mm and assume the chimney to be at datum level.</td><td>5</td><td>CO2</td></tr>
<tr><td>2B.</td><td>Write a short note on Geodimetre in EDM.</td><td>5</td><td>CO2</td></tr>
<tr><td>3A.</td><td>Two tangents intersecting at a chainage of 680m. The angle of intersection of two straights being 130^o. It is proposed to introduce simple circular curve of radius 150m. Calculate the necessary data to set out a curve by linear method of offsets from chord produced. Take peg interval equal to 20m.</td><td>6</td><td>CO3</td></tr>
<tr><td>3B.</td><td>Central angle of a non-parallel straights Δ_1 and Δ_2 and length of common tangent are given ($\Delta_2 > \Delta_1$). Find out the common radius R and chainages at starting and end point of a reverse curve.</td><td>4</td><td>CO3</td></tr>
<tr><td>4A.</td><td>A $4^o17'51''$ curve (30m arc) and intersecting angle between two straights was 140^o. The chainage of T_1 is 1804.25m. Calculate the necessary data to set out a curve by Rankine’s method of deflection angle.</td><td>5</td><td>CO3</td></tr>
<tr><td>4B.</td><td>Two straights intersecting at an angle of 60^o. Calculate all the data necessary to set out the Bernoulli’s Lemniscate Curve, at least 10 points are to be marked on the ground for setting out curve, if the apex distance is 25m.</td><td>5</td><td>CO3</td></tr>
<tr><td>5A.</td><td>With neat sketch explain locating of sounding by (a) range and one angle from the shore (b) Intersecting ranges.</td><td>5</td><td>CO4</td></tr>
<tr><td>5B.</td><td>What are the applications of underground surveying? What are the special features in underground surveying?</td><td>5</td><td>CO4</td></tr>
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