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

DEPARTMENT OF CIVIL ENGINEERING

III SEMESTER B.TECH. (CIVIL ENGINEERING)

END SEMESTER EXAMINATION, DEC 2022

SUBJECT: Surveying (CIE 2154)

<table>
<tr><th>Q. NO</th><th>QUESTION</th><th>MARKS</th><th>CO</th></tr>
<tr><td>1A</td><td>The following readings have been taken from a page of an old level book. Fill up the missing quantity and apply the usual checks. Take RL of BM as 100.000m
<table>
<tr><th>Station</th><th>B.S.</th><th>I.S.</th><th>F.S.</th><th>Rise</th><th>Fall</th><th>R.L.</th><th>Remarks</th></tr>
<tr><td>1</td><td>2.567</td><td></td><td></td><td></td><td></td><td></td><td>BM</td></tr>
<tr><td>2</td><td></td><td>1.235</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>3.569</td><td></td><td>0.847</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td>3.285</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>0.431</td><td></td><td>0.926</td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td>2.044</td><td></td><td>2.108</td><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td></td><td></td><td>2.641</td><td></td><td></td><td></td><td></td></tr>
</table></td><td>4</td><td>3</td></tr>
<tr><td>1B</td><td>Illustrate the significance and application of contour</td><td>3</td><td>3</td></tr>
<tr><td>1C</td><td>A flag- staff of 1.7m height was erected, to find the elevation of the top (Q) of a hill, and observations were made from two stations P and R, 80m apart. The horizontal angle measured at P between R and the top of the flag-staff was 63° 45’ and that measured at R between the top of the flag-staff and P was 67° 38’. The angle of elevation to the top of the flag-staff was measured to be 10° 12’ at P. The angle of elevation to the top of the flag-staff was measured to 12° 28’ at R. Staff readings on B.M when the instrument was at P= 2.063m and that with the instrument at R = 2.078m. Calculate the elevation of the top of the hill if that of B.M was 524.034m.</td><td>3</td><td>2</td></tr>
<tr><td>2A</td><td>What is terrestrial photogrammetry? Explain the graphical method of obtaining horizontal and vertical angle measurements from terrestrial photographs.</td><td>4</td><td>5</td></tr>
<tr><td>2B</td><td>Differentiate between whole circle bearing system and Quadrantal bearing system.</td><td>3</td><td>2</td></tr>
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2C	An instrument was set up at P and the angle of depression to a vane 1.8m above the foot of the staff held at Q was 6°24'. The horizontal distance b/w P and Q was known to be 4000m. Determine the RL of the staff station Q, given that staff reading on a BM of elevation 461.05 was 2.845m	**3**	**3**
3A	The stadia intercept read by means of a fixed hair instrument on a vertically held staff is 1.13 meters, the angle of elevation being 3°45. The instrument constants are 100 and 0.2. What would be the total number of turns registered on a movable hair instrument at the same station for a 1.45 meters intercept on a staff held on the same point, the vertical angle in this case being 3°43´ and the constants 100 and 0.3?	**4**	**3**
3B	Derive distance and elevation formula for Inclined sight and Staff Normal to the line of sight, with help of neat sketch	**3**	**3**
3C	The vertical angles to vanes fixed at 1.3m and 3.7m above the foot of the staff held vertically at station Q were 2°64' and 5° respectively. find the horizontal distance and reduced level of Q in elevation of line of collimation as found from back sight to a bench mark is 208.151m	**3**	**3**
4A	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.	**4**	**5**
4B	What are the various operations of setting out of tunnel? Explain the surface survey.	**3**	**5**
4C	Write a short note on echo sounder.	**3**	**5**
5A	An area 15 km x 30 km is to be photographed with 150 mm focal length camera. Determine the flight plan for a scale of 1:25000 effective at an elevation of 400 m. Take the end lap as 65% and side lap as 35%. The size of the photograph is 200 mm x 200 mm. An intervalometer will be used to control the interval between exposures with the least count of 0.5sec. The speed of the aircraft will be maintained at 200 km/hr.	**4**	**5**
5B	With neat sketch explain the graphical method of solving three-point problem in plotting the sounding.	**3**	**5**
5C	With the neat sketch, explain the Location of sounding by stretched wire across a river.	**3**	**5**