MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

MANIPAL INSTITUTE OF TECHNOLOGY

THIRD SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATION, DEC 2022

SURVEYING (CIE 2154)

(–12 - 2022)

TIME: 3 HRS. **MAX. MARKS: 50**

Note: 1. Answer all questions.
2. Any missing data may be suitably assumed.

<table>
<tr><th>Q. NO</th><th>QUESTION</th><th>MARKS</th><th>CO</th><th>BL</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 R.L of B.M as 100.000
<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>3.567</td><td></td><td></td><td></td><td></td><td></td><td>B.M</td></tr>
<tr><td>2</td><td></td><td>2.235</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>3.649</td><td></td><td>1.847</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td></td><td>3.855</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>1.431</td><td></td><td>0.926</td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td>3.044</td><td></td><td>3.108</td><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td></td><td></td><td>3.641</td><td></td><td></td><td></td><td></td></tr>
</table></td><td>4</td><td>2</td><td>3</td></tr>
<tr><td>1B</td><td>Describe the characteristics of contour</td><td>3</td><td>2</td><td>2</td></tr>
<tr><td>1C</td><td>A flag- staff of 1.5m height was erected, to find the elevation of the top (Q) of a hill, and observations were made from two stations P and R, 70m apart. The horizontal angle measured at P between R and the top of the flag-staff was 73° 35' and that measured at R between the top of the flag-staff and P was 77° 18'. 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 10° 2' at R. Staff readings on B.M when the</td><td>3</td><td>2</td><td>3</td></tr>
</table>

	instrument was at P= 1.874m and that with the instrument at R = 1.078m. Calculate the elevation of the top of the hill if that of B.M was 544.045m.			
2A	Discuss the scale of an aerial vertical photograph and also derive the expression for the same in various cases.	**4**		
2B	Define a. Bench Mark b. Reduced Level c. Datum	**3**	**2**	**2**
2C	An instrument was set up at P and the angle of depression to a vane 1.7m above the foot of the staff held at Q was 8°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 656.05 was 2.835m	**3**	**2**	**3**
3A	The stadia intercept read by means of a fixed hair instrument on a vertically held staff is 2.13 meters, the angle of elevation being 3°35. The instrument constants are 100 and 0.3. What would be the total number of turns registered on a movable hair instrument at the same station for a 1.47 meters intercept on a staff held on the same point, the vertical angle in this case being 4°54´ and the constants 100 and 0.2?	**4**	**3**	**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**	**2**
3C	The vertical angles to vanes fixed at 1.7m and 3.3m above the foot of the staff held vertically at station Q were 3°66' 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 204.137m	**3**	**3**	**3**
4A	Two points A and B having elevations of 400m and 600m respectively above datum appear on the vertical photograph having focal length of 20cm and flying altitude of 2400m above datum. Their corrected photographic co-ordinates are as follows: Points | Photographic co-ordinates: x (cm) = +2.45, y (cm) = +1.36 (A); x (cm) = -1.72, y (cm) = +2.65 (B) Find the length of the ground line AB.	**4**		
4B	Explain the operation of transferring the surface alignment to underground line.	**3**		
4C	What are different methods of sounding and explain in detail.	**3**		
5A	What is datum scale? And explain the different types of photographs in aerial photogrammetry.	**4**		
5B	What are the requirement of sounding? And describe briefly how the soundings are located by two angles from the shore and intersecting ranges.	**3**		
5C	What are the applications of underground surveying? What are the special features in underground surveying?	**3**		