**M.Sc. 2nd Semester Examination, 2021**

**Subject: Geography**

**Course Title: Surveying, Topographical Map Interpretation and Field Study**

**Course Code: 204C**

**Course ID: 21964**

**Full Marks: 40** **Time: 3 hours**

The figures in the right hand side margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable
*Answer all the questions.*

**UNIT I**

**1.** **(3 × 5 = 15)**

**a)** Complete the Field Book table given below and draw the cross-section of the river, which has been surveyed using a Dumpy Level and Prismatic Compass.

**River Sankha Cross Profile - immediately downstream of Balarampur Bridge, Puruliya**

| Station | Line | Magnetic Bearing (degrees) | Segment Distance (m) | Staff Reading B.S. (m) | Staff Reading I.S. (m) | Staff Reading F.S. (m) | Remarks |
|---|---|---|---|---|---|---|---|
| A | AB | AB - 326 | 0.00 | 1.39 | | | B.M at A - 220m |
| A1 | | | 11.00 | | 2.30 | | |
| A2 | | | 6.25 | | 2.85 | | |
| A3 | | | 5.40 | | 2.61 | | |
| A4 | | | 13.00 | | 3.05 | | |
| A6 | | | 2.80 | | 4.00 | | |
| A7 | | | 2.30 | | 3.35 | | |
| A8 | | | 1.00 | | 2.60 | | |
| B | | | 3.20 | | 1.60 | | |
| A5 | | | 3.40 | 1.64 | | 3.60 | |
| B1 | | | 10.00 | | 2.52 | | |
| B2 | | | 10.20 | | 3.43 | | |
| B3 | | | 6.90 | | 3.69 | | |
| B4 | | | 6.20 | | 5.02 | | |
| B5 | | | 5.20 | | 4.84 | | |
| B6 | | | 5.90 | | 4.76 | | |
| B7 | | | 14.10 | | 3.63 | | |
| B8 | | | 3.10 | | | 3.11 | |

**b)** A tower has an elevation angle of 60° from a point due north of it and an elevation angle of 45° from a point due south. If the distance between these two points is 200 m, find the height of the tower and its distance from each of these points.

**c)** The top of a pole previously erected on Station B (whose base is now inaccessible), was observed using a transit theodolite kept at Station $O_1$ with the obtained vertical circle readings being 15° 04′ and 15° 02′ for $V_C$ and $V_D$ respectively on the Left Face and again being 15° 00′ and 15° 02′ for $V_C$ and $V_D$, respectively, on the Right Face. The top of the same pole at the same station was re-observed again by the same theodolite now kept at Station $O_2$, which was 3.65 metres nearer the object than the first station and along the same straight line joining both the stations and the object, all three being situated on the same level plane surface. At the second Station, the obtained vertical circle readings were 16° 04′ and 16° 03′ for $V_C$ and $V_D$ respectively on the Left Face and 16° 05′ and 16° 04′ for $V_C$ and $V_D$, respectively on the Right Face. If the measured instrument heights at the Stations $O_1$ and $O_2$ were 1.62 metres and 1.25 metres, respectively, compute the height of the pole above the Station B and its distance from Station O1.

## UNIT II

**2.** **(3 × 5 = 15)**

**a)** Extract the OSM Sheet Number for the topographical map drawn at a scale of 1:2000 in which there is located a point X, the position of which is at (23º 11′ 23″ S, 86º 17′ 19″ W).

**b)** Use the data given below to construct an altimetric frequency histogram and interpret accordingly. (All elevations are in metres).

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 220 | 239 | 239 | 240 | 240 | 240 | 240 | 240 | 240 | 250 | 250 | 252 | 260 | 260 |
| 260 | 260 | 260 | 260 | 264 | 270 | 280 | 280 | 283 | 300 | 300 | 340 | 360 | 400 |
| 420 | 440 | 460 | 480 | 500 | 500 | 520 | 540 | 540 | 560 | 580 | 600 | 600 | 600 |
| 600 | 620 | 620 | 637 | 660 | 665 | 677 | 680 | | | | | | |

**c)** Use the data given below to construct a long profile for the Bandu Nala and interpret it accordingly.

| **Distance Downstream (m)** | 0.0 | 0.3 | 0.7 | 2.0 | 3.7 | 4.0 | 5.7 | 6.3 | 9.0 | 12.0 | 14.7 | 23.0 | 33.1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Elevation (m)** | 600.9 | 580.1 | 561.6 | 520.0 | 464.5 | 440.1 | 425.9 | 379.5 | 314.2 | 295.1 | 280.0 | 253.0 | 218.0 |

## UNIT III

**3.** **(1 × 10 = 10)**

**a)** As a researcher, you have been asked to conduct a ward-level survey in a town to determine the solid waste management status from each household and the condition of those engaged in this providing this service. Design a comprehensive questionnaire with suitable queries that can be used for the above purpose.

---