



আন্তর্জাতিক ইসলামী বিশ্ববিদ্যালয় চট্টগ্রাম  
 الجامعة الإسلامية العالمية شيتاغونغ  
 International Islamic University Chittagong  
 Department of Civil of Engineering (CE), FSE

END-OF-SEMESTER EXAMINATION  
 SPRING SEMESTER 2022

|              |                                       |                |                            |
|--------------|---------------------------------------|----------------|----------------------------|
| Programme    | : Civil Engineering                   | Level of Study | : UG                       |
| Time         | : <u>8:30~11:00 am</u>                | Date           | : June 11, 2022,<br>Sunday |
| Duration     | : <u>Two hours and thirty minutes</u> |                |                            |
| Course Code  | : CE-1103                             | Section(s)     | : 1                        |
| Course Title | : Surveying                           |                |                            |

This Question Paper Consists of 3 (**three**) Printed Pages (Including Cover Page) with 5 (**five**) Questions.

**INSTRUCTION(S) TO CANDIDATES**

**DO NOT OPEN UNTIL YOU ARE ASKED TO DO SO**

- Total mark of this examination is **100**.
- This examination is worth **50%** of the total course assessment.
- Answer **ALL Questions**.
- Only approved calculator with '**CE- approved**' sticker is allowed (non-programmable and non-graphical).
- Marks assigned to each question are listed in the margin.

**Any form of cheating or attempt to cheat is a serious offence, which may lead to dismissal.**

**All electronics gadgets are prohibited in the exam hall/venue.**

(e.g. mobile/smart phones, smart watches, and smart glasses)

**Section A: 60 Marks**  
**(Answer all three (3) Questions)**

**QUESTION 1 (20 Marks)**

- a) Explain the advantages or uses of TACHEOMETRY (05)
- b) Explain the method of determining TACHEOMETRIC constants in the field. (05)
- c) The readings of a TACHEOMETRIC survey are shown in the following Table. (10)  
Calculate the horizontal distance between A and B and the elevation of B if the Reduced Level (R.L) of Bench Mark (BM) is 418.685 m. The constants of the instruments were 100 and 0.3.

| TACHEOMETER STATION | Staff held Vertical at | Staff Reading (m)   | Vertical Angle |
|---------------------|------------------------|---------------------|----------------|
| A                   | B                      | 2.255, 2.605, 2.955 | 8°24'          |
|                     | BM                     | 1.640, 1.920, 2.200 | 1°6'           |

**QUESTION 2 (20 Marks)**

- a) Mention the properties of a spherical triangle. (05)
- b) Find the shortest distance between two places A and B, given that the latitudes of A and B are 15°0' N and 12°6' N and their longitudes are 50°12' E and 54°0' E respectively. (07)
- c) Find the local apparent time of an observation at a place in longitude 60°18' E, corresponding to local mean time 10<sup>h</sup>20<sup>m</sup>30<sup>s</sup>, the equation of time at G.M.N. being 5<sup>m</sup>4.35<sup>s</sup> additive to the mean time, and decreasing at the rate of 0.32<sup>s</sup> per hour. (08)

**QUESTION 3 (20 Marks)**

- a) What are the purposes of photogrammetry? Define different types of photogrammetry. (05)
- b) A camera having focal length 20 cm, is used to take a vertical photograph to a terrain having an average elevation of 1500 m. What is the height above of sea level at which an air-craft must fly in order to get the scale of 1: 8000? (05)
- c) List the purposes and benefits of Drone photogrammetry (05)
- d) The scale of the aerial photograph is 1 cm= 100 m. The photograph size is 20 cm x 20 cm. Determine the number of photographs required to cover an area of 100 sq. km if the longitudinal lap is 60% and the side lap is 30%. (05)

**Section B: 40 Marks**  
**(Answer all two (2) Questions)**

**QUESTION 4 (20 Marks)**

- a) Explain the basic functions of GIS? Explain some of the areas of GIS application. (07)
- b) Describe various components of GIS and explain their functions. (06)
- c) i) Make a schematic diagram with various elements of an ideal Remote Sensing (RS) system. (05)  
ii) What are the characteristics of RS? (02)

**QUESTION 5 (20 Marks)**

- a) What are the benefits and advantages of GPS surveying over traditional surveying methods? (05)
- b) Describe the different sources of errors in surveying. (06)
- c) Describe the general steps of project surveying. (05)
- d) Write a short note on Total Station (04)

**END OF PAPER**