MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : CE(PC)403 Surveying & Geomatics

UPID : 004447

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following : [1 x 10 = 10]
   - (i) For placing focal plane, which is used as a reference?
   - (ii) What is the principle of remote sensing?
   - (iii) What is an Image?
   - (iv) What do geomatics engineers do?
   - (v) Which type of surveying is used for exploring mineral wealth?
   - (vi) What is a line lying in a level surface?
   - (vii) What is the trunnion axis of Theodolite?
   - (viii) When total station is sighted to the target, which operation acts first?
   - (ix) How much inclination must be provided in a tilted photograph?
   - (x) Write down the Stefan- Boltzmann formula.
   - (xi) How cones and rods are distributed in retina?
   - (xii) Who is the father of Geomatics?

Group-B (Short Answer Type Question)

Answer *any three* of the following : [5 x 3 = 15]

2. Describe different types of corrections for chain and tape. [5]
3. Define the following terms in connection to leveling: (i) datum surface, (ii) line of collimation, (iii) reduced level, (iv) bench mark and (v) change point. [5]
4. A traverse is made in the form of a square taking in clockwise order. If the bearing of AB is 120° 30', find the bearing of the other sides. [5]
5. Distinguish between single frequency receivers and double frequency receivers. [5]
6. What is the principle of stadia method? Derive the distance and elevation formula when the staff is held vertically and is inclined to the line of sight. [5]

Group-C (Long Answer Type Question)

Answer *any three* of the following : [15 x 3 = 45]

7. (a) The distance from two points on a photographic point to the principal line are 68.24 mm to the left and 58.48 mm to the right. The angle between the points measured with a transit is 44 ° 30'. Determine focal length of the lens. [8+7]
   (b) What are terrestrial photogrammetry and aerial photogrammetry?
8. (a) What do you understand by remote sensing? [3+4+4+4]
   (b) Briefly explain remote sensing process?
   (c) Explain wave model of EMR?
   (d) What is electromagnetic spectrum?
9. (a) Explain: Image transformation. [3+6+6]
   (b) What are the differences between image supervised and unsupervised classification?
   (c) What do you understand by post-classification accuracy assessment?
10. (a) What are the recent advancements in remote sensing for Civil Engineering? [5+6+4]
    (b) Explain static and rapid static methods of GPS survey.
    (c) Explain geographic coordinate system and projected coordinated system.
11. (a) Explain the concept of degree of a curve with relevant mathematical expressions. [3+6+6]
    (b) Derive the mathematical expressions for setting out a simple circular curve for the methods involving radial and perpendicular offsets from tangents.

(c) A curve of radius 300 m has a deflection angle of 30°. Calculate and tabulate the radial and perpendicular offsets from the tangent to locate points on the curve. The number of offsets should be such that the offset length is less than 20 m.

*** END OF PAPER ***