B.Tech Compartmental Examination

Under Gauhati University

Feb - 2022

SURVEYING - II
CE401
IV Semester
Full Marks: 100
Time: Three hours
***The figures in the margin indicate full marks for the questions.***

A. Multiple Choice Questions   1×20=20

1. In stadia method of tacheometric surveying, K and C are given as
   a. $K=(f/i)$ and $C=(f+d)$
   b. $K=(f/d)$ and $C=(f+i)$
   c. $K=(f/p)$ and $C=(f+i)$
   d. $K=(f/p)$ and $C=(f+d)$

2. In subtense method of tacheometric surveying
   a. i and s both are constants
   b. i is variable and s is constant
   c. i is constant and s is variable
   d. i and s depends upon the type of instruments

3. Which of the following is NOT true for tacheometric surveying
   a. Distances of points are obtained by optical means
   b. Stadia method is also known as fixed hair method
   c. Can be used for both horizontal and inclined sights.
   d. The anallactic lens provided in internal focusing telescope make the additive constant $C=0$

4. What is the tangent length if the deflection angle is $60°15'$ and radius of the curve is 20 chains?
   a. 11.605 chains
   b. 10.605 chains
   c. 11.500 chains
   d. 10.500 chains

5. Find out the length of the curve if the deflection angle is $51°40'$. Radius of the curve is 16 chains and length of the chain equal to 20 m (100 links).
   a. 290.60 m
   b. 280.56 m
   c. 288.56 m
   d. 289.60 m

6. Which of the following is NOT true
   a. Transition curve has varying radius
   b. Transition curve is introduced between tangent and circular curve
   c. Curvature of transition curve should be zero at the origin of curve
   d. Transition curve should meet the circular curve perpendicularly

7. In triangulation the height of instrument and signal does not depend upon
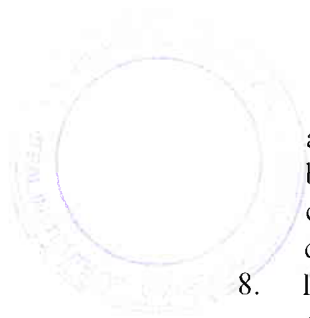
a. The distance between the stations
b. The relative elevation of stations
c. The profile of the intervening ground
d. The intensity and visibility of the signal

8. If the satellite station is to the left of the true station, the true angle is given as
   a. $\alpha = \theta + \beta_1 - \beta_2$
   b. $\alpha = \theta - \beta_1 - \beta_2$
   c. $\alpha = \theta + \beta_1 + \beta_2$
   d. $\alpha = \theta - \beta_1 + \beta_2$

9. Among the classification of triangulation system which poses the highest order
   a. Primary
   b. Secondary
   c. Tertiary
   d. Quaternary

10. Which of the following is NOT a method to calculate the area
    a. By offsets to base line
    b. Trapezoidal rule
    c. Simpson's one-third rule
    d. Prismoidal rule

11. In photogrammetry if the tilt of the camera axis is more than $3°$ the photographs are called
    a. Vertical photographs
    b. Oblique photographs.
    c. Digital photographs
    d. Terrestrial photographs

12. Which information is not recorded in photographs in a photogrammetry
    a. Fiducial marks
    b. Time of exposure
    c. Principal distance
    d. Size of photographs

13. In photogrammetry the scale of the photograph is given by
    a. $S = \dfrac{f}{H - h}$
    b. $S = \dfrac{f}{h - H}$
    c. $S = \dfrac{H}{f - h}$
    d. $S = \dfrac{h}{H - f}$

14. Which triangulation system will NOT give the most accurate result
    a. Central figure
    b. Quadrilateral
    c. Single chain
    d. Double chain

15. Which of the following describe the main purpose of the satellite station
    a. Act as true station
    b. Act as false station
    c. To measure length

d.   To measure elevation
16.   What is the average elevation of terrain if the scale is given as 40 m, focal length and height of station as 5 m and 25 m?
    a.   20.48
    b.   24.87
    c.   24.00
    d.   21.26
17.   Overlapping in the direction of flight is called as
    a.   Side overlap
    b.   Adjacent overlap
    c.   Forward overlap
    d.   Backward overlap
18.   The correct sequence of transmission of electromagnetic waves in remote sensing system can be given as
    a.   Energy source, transmission of signal, propagation of signal
    b.   Transmission of signal, propagation of signal, energy source
    c.   Propagation of signal, transmission of signal, energy source
    d.   Energy source, propagation of energy, transmission of signal
19.   GIS uses information from which of the following sources
    a.   Non-spatial information system
    b.   Spatial information system
    c.   Global information system
    d.   Position information system
20   Which of the following shapes is preferred in case of Simpson's rule
    a.   Square
    b.   Triangle
    c.   Trapezoid
    d.   Rectangle

B.   Very Short Question   2×6=12
    1.   Define tacheometric surveying?
    2.   What is compound curve?
    3.   What is the principle of stadia method in tacheometric surveying?
    4.   Define geographical information system?
    5.   What are the classifications of triangulation system?
    6.   Define aerial photogrammetry?

C   Short Question   4×7=28
    1.   Explain the procedure to determine the tacheometric constants K and C by field observation method.
    2.   Explain how a simple circular curve is set out by successive bisection of arcs.
    3.   In triangulation survey how will you determine the distance between the stations, explain?
    4.   A line 2550 m long lying at an elevation of 500 m measures 10.25 cm on a vertical photograph for which focal length is 20 cm. Determine the scale of the photograph for area having average elevation of 800 m.
    5.   A tacheometric observations were made from an instrument at P. The line of sight made an inclination of +8°30' with the horizontal. The staff held at Q made an intercept of 2.550 m and the axial reading was half of the staff intercept. Find out the horizontal distance PQ and the R.L. of Q if the instrument axis had an R.L. of 98.610 m. Take K=100 and C=0.2
    6.   Explain the different components of remote sensing?

7. Mention few advantages and disadvantages of GIS?

D Long Question   10×4=40

1. Two straights AB and BC are intersected by a line D_1D_2. The angles BD_1D_2 and BD_2D_1 are 40°30′ and 36°24′ respectively. The radius of the first arc is 600 m and that of the second arc is 800 m. if the chainage of intersection point B is 8248.1 m, find the chainage of the tangent points and the point of compound curvature.

2. Determine the gradient from a point A to a point B from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertically.

Instrument Station	Staff Point	Bearing	Vertical angle	Staff readings
P	A	134°	+10°32′	1.360, 1.915, 2.470
	B	224°	-5°6′	1.065, 1.965, 2.865

3. What is Remote Sensing? With the help of a neat diagram, explain the idealized remote sensing system.

4. Find out the desired date to compute a flight mission for an area 8 km wide and 16 km long. The airplane has a speed of 192 km/h. A camera with a focal length of 21 cm is to be used. The approximate scale is 1:10,000. The average elevation of the ground is 366 m and the photographs are to be 23 cm × 23 cm. the forward lap is 60% and the side lap is 25%.

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