

G 1566

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Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, MAY 2016

Fourth Semester

Branch : Civil Engineering

CE 010 405—SURVEYING - II (C E)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

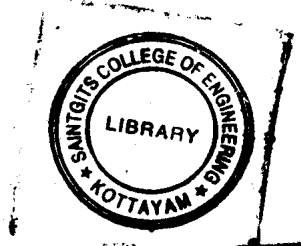
Time : Three Hours

Maximum : 100 Marks

Part A

*Answer all questions.
Each question carries 3 marks.*

1. State the objectives of geodetic triangulation.
2. State the principle of least squares.
3. What do you mean by sounding ?
4. What is the principle of terrestrial photogrammetry ?
5. What is Autumnal Equinox ?



(5 × 3 = 15 marks)

Part B

*Answer all questions.
Each question carries 5 marks.*

6. What is meant by Well-Conditioned triangle ?
7. How can we determine the probable error ?
8. What is Echo Sounding ? State its principle.
9. With a neat sketch explain the components of an aerial camera ?
10. What is a spherical triangle ? What are its properties ?

(5 × 5 = 25 marks)

Part C

*Answer all questions.
Each question carries 12 marks.*

11. What is meant by a satellite station and reduction to centre ? Derive expression for reducing the angles measured at the satellite stations to centre.

Or

Turn over

12. Two triangulation stations A and B are 40 km apart and have elevations of 178 m and 175 m respectively. Find the minimum height of signal required at B so that the line of sight may not pass nearer the ground than 3 metres. The intervening ground may be assumed to have a uniform elevation of 150 metres.
13. Find the most probable values of the angles A and B from the following observations at a station O :

$$A = 9^\circ 48' 36''.6 \text{ weight } 2 \text{ (1)}$$

$$B = 54^\circ 37' 48''.3 \text{ weight } 3 \text{ (3)}$$

$$A + B = 104^\circ 26' 28''.5 \text{ weight } 4 \text{ (3)}$$

Or

14. The following angles were measured at a station O so as to close the horizon :

$$\angle AOB = 83^\circ 42' 28''.75, \text{ weight } 3$$

$$\angle BOC = 102^\circ 15' 43''.26, \text{ weight } 2$$

$$\angle COD = 94^\circ 38' 27''.22, \text{ weight } 4$$

$$\angle DOA = 79^\circ 23' 23''.77, \text{ weight } 2$$

15. Describe in detail the location of sounding stations by means of : (a) cross rope soundings ; (b) Intersecting ranges.

Or

16. Explain in detail the different types of EDM instruments.
17. Photographs of a certain area were taken from P and Q, two camera stations, 100 m apart. The focal length of the camera is 150 mm. The axis of the camera makes an angle of 60° and 40° with the base line at stations P and Q respectively. The image of a point A appears 20.2 mm to the right and 16.4 mm above the hair lines on the photograph taken at P and 35.2 mm to the left on the photograph taken at Q. Calculate the distance PA and QA and elevation of point A, if the elevation of the instrument axis at P is 126.84 m.

Or

18. The ground length of a line AB is known to be 545 m and the elevations of A and B are respectively 500 m and 300 m above msl. On a vertical photograph taken with a camera having focal length of 20 cm include the images a and b of these points, and their photographic co-ordinates are :

$$(x_a = + 2.65 \text{ cm}, y_a = + 1.36 \text{ cm}) ; (x_b = - 1.92 \text{ cm}, y_b = + 3.65 \text{ cm})$$

The distance ab scaled directly from the photograph is 5.112 cm. Compute the flying height above MSL.

19. Two parts have the same latitude l and their longitudes differ by $2d$. Prove that the length of the shortest route between them is $2RS \sin^{-1}(\sin d \cos l)$, where R is the mean radius of the earth. Find the greatest distance, along a median, between the shortest route and the parallel of latitude through the ports (UL).

Or

20. Find the L.M.T. of observation at a place from the following data :—

L.A.T. of observation = $15^{\text{h}} 12^{\text{m}} 40^{\text{s}}$

E.T at G.M.N = $5^{\text{m}} 10.65^{\text{s}}$ additive to apparent time and increasing at 0.22^{s} per hour.

Longitude of the place = $20^{\circ} 30' \text{ W}$.

(5 × 12 = 60 marks)