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M – 6077

Reg. No. :

Name :

Fourth Semester B.Tech. Degree Examination, December 2021

13.405 : SURVEYING II (C)

(2013 Scheme)

Time : 3 Hours

Max. Marks : 100

PART – A

(Answer all questions)

1. Compare the various systems of triangulation.
2. The observed values of a level reading are: 2.325, 2.345, 2.225, 2.320, 2.350, 2.340, 2.365 and 2.335. Calculate the probable error anticipated in a single observation and its mean.
3. Differentiate between 'Equilibrium Cant' and 'Cant Deficiency' related with super-elevation of curves.
4. Explain the errors that are anticipated in total station surveying.
5. Explain the terms 'vertical photographs', 'oblique photographs' and 'overlapping' of photographs.

(5 × 4 = 20 Marks)

PART – B

(Answer ONE Question from each module)

Module – I

6. (a) Discuss the term 'satellite stations' and 'reduction to centre' 6
- (b) In measuring angles from a triangulation station B, it was found necessary to set the instrument at a satellite station S, due south of the main station B and at a distance of 12.2 m from it. The line BS approximately bisects the

P.T.O.

exterior angle ABC. The angles ASB and BSC were observed to be $30^{\circ} 20' 30''$ and $29^{\circ} 45' 10''$ respectively. When station B was observed, the angles CAB and ACB were found to be $59^{\circ} 18' 20''$ and $61^{\circ} 26' 22''$ respectively. AC = 4248.9 m. Find the correct value of the angle ABC 14

OR

7. (a) Explain the features of 'accidental errors'. 6

(b) During a traverse surveying, following angles were measured at a station closing the horizon. Calculate the most probable values of angles :

A = $72^{\circ} 41' 23''$ Wt 3

B = $48^{\circ} 28' 41''$ Wt 2

C = $102^{\circ} 41' 33''$ Wt 2

D = $136^{\circ} 08' 38''$ Wt 3 14

Module – II

8. (a) Suggest a suitable method for gradually introducing super-elevation in highways before vehicles negotiate circular curves from straight roads. 8

(b) Two straights meet at a deflection angle of 55° at a chainage of 1248 m. Set out a circular curve with a radius of 180 m with transition curves of 60 m on both ends. Calculate the chainage of salient points of the combined curve. Explain the procedure to set out the combined curve in the field. 12

OR

9. (a) Explain the features of Bernoulli's lamniscate and cubic parabola. 8

(b) Two straights AB and BC intersect at a chainage of 2100.00 m, the intersection angle being 140° . Calculate the radius and chainage of tangent points of a 6° circular curve that can connect the two straights. Prepare a tabular form with all data necessary for setting out this curve by Rankin's method of deflection angles, if the length of chain available is 30 m. 12



Module - III

10. (a) Explain the principle of EDM and discuss the different types. **10**
(b) Explain the Principle, components and applications of GPS. **10**

OR

11. (a) Explain the procedure of using Total Station in surveying. **12**
(b) List out the advantages and limitations of Total station applications. **6**

Module - IV

12. (a) Explain the term 'relief displacement' on a vertical photograph. **8**
(b) Photographs of a certain area were taken from P and Q, two camera stations, 110 m apart. The focal length of the camera is 145 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 the point A appears 21.2 mm to the right and 15.4 mm above the hair lines on the photograph taken at P and 34.2 mm to the left on the photograph taken at Q. Calculate the distance PA and QA and the elevation of the point A, if the elevation of the instrument axis at P is 125.360 m. **12**

OR

13. (a) How can you compute the horizontal angles and azimuth of a line from terrestrial photogrammetric measurements? **10**
(b) A section line AB appears to be 20.32 cm on a photograph for which the focal length is 15 cm. The corresponding line measures 5.12 cm on a map which is to a scale of 1:50000. The terrain has an average elevation of 520 m above MSL. Compute the flying altitude of the aircraft above MSL, when the photograph was taken. **10**

(4 × 20 = 80 Marks)

