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Question Paper Code : 80068

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Third Semester

Civil Engineering

CE 8351 — SURVEYING

(Common to Environmental Engineering)

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define an “agonic and isogonic lines”.
2. Find the combined correction for curvature and refraction for a distance of a
 - (a) 3400 m
 - (b) 1.29 km.
3. What is the basic principle followed in stadia method?
4. What are the factors on which the choice of contour interval depends?
5. Differentiate between Laplace station from satellite station.
6. Find the most probable value of the angle A from the following observation equations
$$A = 40^{\circ} 20' 12''$$
$$2A = 80^{\circ} 40' 20''$$
$$6A = 40^{\circ} 20' 12''$$
7. Name the factors to be considered in the selection of a discharge site.
8. What is the relation between the Right ascension and Hour angle?
9. Bring out the temporary adjustments of a total station.
10. List the advantages of GPS surveying.

PART B — (5 × 13 = 65 marks)

11. (a) (i) A chain line PQ intersects a pond. Two points A and B are taken on the chain line on opposite sides of the pond. A line AC, 250 m long, is set out on the left of AB and other line AD, 300 m long is set out on the right of AB. Points C, B and D are in the same straight line. CB and BD are 100 m and 150 m long respectively. Calculate the length of AB. (7)
- (ii) A traverse ABCDA is made in the form of a square taking in clockwise order. If the bearing of AB is $120^\circ 30'$, find the bearing of the other sides. (6)

Or

- (b) The following consecutive readings were taken with a levelling instrument at intervals of 20 m. The readings are 2.375, 1.730, 0.615, 3.450, 2.835, 2.070, 1.835, 0.985, 0.435, 1.630, 2.255, and 3.630 m. The instrument was shifted after fourth and eighth readings. The last reading was taken on a BM of RL 110.200 m. Find the RL of all the points. (13)
12. (a) The top (Q) of a chimney was sighted from two stations P and R at very different levels, the stations P and R being in line with the top of the chimney. The angle of elevation from P to the top of the chimney was $38^\circ 21'$ and that from R to the top of the chimney was $21^\circ 18'$. The angle of the elevation from R to a vane 2m above the foot of the staff held at P was $15^\circ 11'$. The heights of instrument at P and R were 1.87m and 1.64m respectively. The horizontal distance between P and R was 127 m and the reduced level of R was 112.78 m. Find the RL of the top of the chimney and the horizontal distance from P to the chimney. (13)

Or

- (b) The following observations were made using a tacheometer fitted with an anallactic lens.

Instrument station	Height of instrumentation	Staff station	WCB	Vertical angle	Stadia Hair readings	Remarks
O	1.550	A	$30^\circ 30'$	$4^\circ 30'$	1.155, 1.755, 2.355	RL of O = 150.000 m
		B	$75^\circ 30'$	$10^\circ 15'$	1.250, 2.000, 2.750	

Calculate the distance AB, RL of A and B. Find also the gradient of line AB. (13)

13. (a) A satellite station S is 6.5 m from the main station A and the following observations were taken $A = 0^\circ 0'$; $B = 102^\circ 48'$; $C = 256^\circ 12'$; $D = 324^\circ 6'$. The length AB, AC and AD were computed to be 1895 m, 2277 m, 2522 m respectively. Determine the direction of the line AB, AC and AD. (13)

Or

- (b) The following angles were measured at a station O so as to close the horizon:

$$\angle AOB = 83^\circ 42' 28.75'' \quad \text{weight 3}$$

$$\angle BOC = 102^\circ 15' 43.26'' \quad \text{weight 2}$$

$$\angle COD = 94^\circ 38' 27.22'' \quad \text{weight 4}$$

$$\angle DOA = 79^\circ 23' 23.77'' \quad \text{weight 2}$$

Adjust the angle by method of correlates. (13)

14. (a) Explain the different coordinates systems by which the position of heavenly body can be specified. (13)

Or

- (b) Explain various sounding methods in detail. (13)

15. (a) (i) Explain the working principle of a total station. (8)
(ii) Discuss the different sources of errors in a total station. (5)

Or

- (b) Explain in detail about the different segments of GPS. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Discuss the field procedures involved in preparing a map of a proposed hospital building. (15)

Or

- (b) With a neat sketch, explain the types of surveying for the construction of highway include all possible measurements required.



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Question Paper Code : 90108

B.E./B.Tech DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Third Semester
Civil Engineering
CE 8351 : SURVEYING
(Common to Environmental Engineering)
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART - A

(10×2=20 Marks)

1. Differentiate between true bearing and magnetic bearing.
2. What is meant by balancing of sights ?
3. What is the need for providing anallatic lens ?
4. Define contour interval.
5. What do you mean by reduction to centre ?
6. Find the most probable value and the probable error of the area of a circle whose radius is 15.40 ± 0.02 m.
7. What is celestial sphere ?
8. List the different solutions for a three-point problem.
9. What is a total station ?
10. What is the need for anti-spoofing in GPS ?



PART – B

(5×13=65 Marks)

11. a) Describe the different equipment required for ranging and chaining and explain the different methods of ranging.

(OR)

- b) Explain the temporary adjustments of a level. How is the reduction of levels and booking of staff readings done using the rise and fall system ?

12. a) A tacheometer is set up at an intermediate point on a traverse course AB and the following observations are taken on a staff held vertically. The instrument is fitted with an anallatic lens and the multiplying constant is 100. The reduced level of A being given as 350.75 m, calculate the length of AB and the reduced level B.

Staff station	Bearing	Vertical angle	Intercept	Axial hair reading
A	40°35'	- 4°24'	2.172	1.962
B	220°35'	- 5°12'	1.986	1.866

(OR)

- b) To determine the elevation of the top of the aerial pole, the following observations were made :

Instrument Station	Reading on BM	Angle of elevation	Remarks
A	1.377	11°53'	RL of BM =
B	1.263	8°5'	30.150 m

Station A and B and the top of the aerial pole are in the same vertical plane. Find the elevation of the top of the aerial pole, if the distance between A and B was 30 m.

13. a) Find the most probable values of the following angles closing the horizontal at a station.

P = 45°23'37" weight = 1

Q = 75°37'15" weight = 2

R = 125°21'21" weight = 3

S = 113°37'59" weight = 3

(OR)

- b) In measuring angles at a triangulation station C, it was found necessary to set the transit over another station P south west of C and 3 m from C, so that the angle APB is approximately bisected by the line PC. The angles APC and CPB were found to be 28°20'35" and 31°26'45" respectively. The side AB was computed to be 975 m in the adjacent triangle, and when the station C was observed, the mean values of the angles CAB and CBA were recorded as 61°30'25" and 58°34'20" respectively. Determine the angle ABC.

14. a) What is meant by soundings ? Describe briefly any four methods of locating soundings.

(OR)

- b) Describe the different types of celestial coordinate systems.

15. a) With neat sketches explain the working of a modern total station.

(OR)

- b) Explain the various components of a GPS and its working principle.

PART – C

(1×15=15 Marks)

16. a) What are the sources of error in surveying ? Explain the different precautions and correction procedures that can be adopted to eliminate the errors.

(OR)

- b) List the characteristics of contour lines and uses of contouring. Also explain the different methods of locating and interpolating contours.