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Question Paper Code : 51251

B.E/B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Fourth Semester

Civil Engineering

CE 2254/CE 45/CE 1254/080100021/10111 CE 405 – SURVEYING – II

(Regulations 2008/2010)

(Common to PTCE 2254 – Surveying II for B.E. (Part – Time)

Second Semester – Civil Engineering – Regulations 2009)

Time : Three Hours .

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What are the advantages of Tachometric surveying ?
2. Why is an anallatic lens provided in a tachometer ?
3. Enlist the procedure of permanent adjustment of a theodolite.
4. What do you mean by Horizontal and vertical datum in mapping ?
5. Define shift of an observation.
6. What is weight of observation ?
7. Define celestial sphere and Azimuth axis.
8. List out the generally used methods for determining the latitude of a place.
9. What is a fathometer ?
10. Differentiate between 'tilted photograph' and 'oblique photograph'.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) A tachometer is set up an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff.

Staff station	Vertical angle	Staff intercept	Axial hair reading
P	8°36'	2.35	2.105
Q	6°6'	2.055	1.895

The instrument is fitted with an anallactic lens with multiplying constant 100.

Compute the length of PQ and reduced level of Q, if that of P being 321.5. (10)

- (ii) Two distances of 20 m and 100 m were accurately measured out and the intercepts on the staff between the outer stadia webs were 0.916 m at the former distance and 0.996 m at the later. Calculate the tachometric constant. (6)

OR

- (b) (i) Derive the formulae for the determination of horizontal distance and vertical distance in tangential tachometry when one of the observed angle is an angle of elevation and the other is angle of depression. (6)
- (ii) A tacheometer is set up at intermediate point on a transverse course AB and the following observations are taken on a staff held vertically.

Staff station	Bearing	Vertical angle	Staff intercept	Axial Hair Reading
A	40°35'	+ 2°26'	2.172	2.602
B	220°35'	- 3°10'	1.986	1.905

The instrument is fitted with an anallactic lens and the multiplying constant is 100. The reduced level of A being given as 420.725 m. Calculate the

length of AB and the reduced level of B. (10)

12. (a) What is meant by triangulation ? Describe classification of triangulation. (16)

OR

- (b) (i) Find the sag correction for 30 m steel tape under a pull of 80 N in three equal spans of 10 m each. Mass of one cubic cm of steel = 7.86 g/cm^3 .
Area of cross-section of the tape = 0.10 sq.cm. (6)
- (ii) Describe the different classification of signals ? What are the characteristics of a good signal ? (10)

13. (a) Some levelling were carried out with the following results.

	Rise or Fall	Weight
P to Q	+ 4.32 m	1
Q to R	+ 3.17 m	1
R to S	+ 2.59 m	1
S to P	- 10.04 m	1
Q to S	+ 5.68 m	2

The R.L. of P is known to be 131.31 m above datum. Determine the probable levels of other points. (16)

OR

- (b) (i) Explain in brief the difference between 'standard error' and 'Probable error'. (6)
- (ii) The following are the mean values observed in the measurement of three angles $\angle A$, $\angle B$ and $\angle C$ at a station.

$\angle A$	=	$76^\circ 42' 46.2''$	Weight 4
$\angle A + \angle B$	=	$134^\circ 36' 32.6''$	Weight 3
$\angle B + \angle C$	=	$185^\circ 35' 24.8''$	Weight 2
$\angle A + \angle B + \angle C$	=	$262^\circ 18' 10.4''$	Weight 1

Calculate the most probable value of each angle using normal equation. (10)

14. (a) (i) Explain celestial sphere and celestial coordinate system. (8)
- (ii) Explain step-by-step method to determine the azimuth of a line by observation to SUN. (8)

OR

- (b) (i) Explain different time systems in astronomy. (8)
- (ii) A tacheometer fitted with an anallactic lens was used to observe the following :

From	To	Bearing	Vertical angle	Hair reading		
C	A	320°	+12°	0.906	1.728	2.550
C	B	50°	+10°	0.744	2.199	3.654

The value of the constant was 100 and the staff was held vertically. Determine the length and gradient of AB. (8)

15. (a) (i) Explain the method of plotting of plain metric maps by radial method. (12)
- (ii) What are the applications of photogrammetry? (4)

OR

- (b) (i) Derive the parallax equation for the ground coordinates of a point. (10)
- (ii) A pair of photographs was taken with an aerial camera from an altitude of 500 m above MSL. The mean principle base measured is equal to 90 mm. The difference in parallax between two points is 1.48 mm. Find the difference in height between two points if the elevation of the lower point is 500 m above the datum. What will be the difference in elevation if the parallax difference is 15.5 mm? (6)