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**Question Paper Code : 91229**

B.E./B.Tech. DEGREE EXAMINATION ~~NOVEMBER~~/DECEMBER 2014.

Fourth Semester

Civil Engineering

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

(Regulation 2008/2010)

(Common to PTCE 2254/10111 CE 405 – Surveying II for B.E. (Part-Time)  
Second Semester – Civil Engineering – Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the three types of telescope used in stadia surveying?
2. What do you understand by direct reading tachometer?
3. What is check base?
4. Define reduction to center.
5. Define shift of an observation.
6. What is weight of observation?
7. What is meant by celestial equator?
8. Describe nautical almanac.
9. What is meant by three point problem in hydrographic surveying?
10. What are lunar and solar tides?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain how you would determine the constants of a tachometer. (4)
- (ii) A tachometer was set up at station A and the following readings were obtained on a vertically held staff.

Station	Staff station	Vertical angle	Hair reading	Remarks
A	B.M.	-2° 18'	3.225, 3.550, 3.875	R.L. of B.M. is 437.655 m
	B	+8° 36'	1.650, 2.515, 3.380	

Calculate the horizontal distance from A to B and the R.L. of B, if the constants of the instrument were 100 and 0.4. (12)

Or

- (b) (i) Derive the formulae for the determination of horizontal distance and Vertical distance in tangential tachometry when both the angles are angles of depression. (6)
- (ii) A tachometer 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	Intercept	Axial hair reading
A	40° 35'	-4° 24'	2.172	1.962
B	220° 35'	-5° 12'	1.986	1.866

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 of B. (10)

12. (a) From the satellite station S 5.8 m from the main triangulation station A the following directions were observed :

A	00°	0'	0"
B	130°	18'	30"
C	232°	24'	6"
D	296°	6'	11"

The length AB, AC and AD were 3265.5 m, and 4022.2 m and 3086.2 m respectively. Determine the directions of AB, AC and AD. (16)

Or

- (b) (i) Find the difference of level of the points A and B and the reduced level of B from the following trigonometrical leveling data.

Horizontal distance between A and B	=	5625.389 m
Angle of depression from A and B	=	1°28'34"
Height of signal of B	=	3.886 m
Height of instrument at A	=	1.497 m
Coefficient of refraction	=	0.07
R sin 1"	=	30.876 m
Reduced level of A	=	1265.85 m (12)

- (ii) Explain the various tape corrections to be applied for calculated length of base line. (4)

13. (a) The angles of the triangle ABC were recorded as A = 77° 14' 20" weight 4; B = 49° 40' 35" weight 3 ; C = 53° 04' 52" weight 2; Give the corrected values of the angles. (16)

Or

- (b) (i) Explain the general principles of least squares. (8)
- (ii) What are the laws of random errors? (8)

14. (a) Calculate the sun's azimuth and hour angle at sunset at a place in latitude  $42^{\circ} 30' N$ , when its declination is (16)
- (i)  $22^{\circ} 12' N$  and  
(ii)  $22^{\circ} 12' S$

Or

- (b) Enumerate and explain the relationships between the coordinates of celestial sphere. (16)
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 principal 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)