KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: JUNE 2015

(Regulation 2009)

Third Semester

CIVIL ENGINEERING

CEE106 : Surveying I

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. The Representative fraction of Cadastral maps is
   a) 1/500 to 1/5000 b) 1/5000 to 1/20000
   c) 1/1000 to 1/20000 d) 1/5000 to 1/10000
2. Diameter of Ranging rods is
   a) 10mm b) 20mm
   c) 30mm d) 40mm
3. If the true bearing of AB is 269°30', then the Azimuth of the line AB is
   a) 0°30' b) 89°30'
   c) 90°30' d) 269°30'
4. In a magnetic compass, which is used to read the directions of lines?
   a) Magnetic needle b) Line of sight
   c) Graduated circle d) Compass box
5. Least count of a Levelling staff is
   a) 0.002m b) 0.003m
   c) 0.004m d) 0.005m
6. A relatively permanent point of reference whose elevation with respect to some assumed datum is known as
   a) Mean sea level b) Benchmark
   c) Elevation d) Reduced level
7. Which of the following sights are taken on a turning point?
   a) Foresight b) Backsight
   c) Foresight and Backsight d) Foresight and Intermediate sight

8. Size of a theodolite is specified by

a) the length of telescope
b) the diameter of vertical circle
c) the diameter of lower plate
d) the diameter of upper plate

9. The expression for measurement of horizontal distance by Subtense bar method is

a) $D = s*206265 / \beta$
b) $D = s / \beta*206265$
c) $D = \beta*206265 / s$
d) $D = s*206265 / 2\beta$

10. Lens formula with respect to focal distances is

a) $1/f = f_1 + f_2$
b) $f = f_1 + f_2$
c) $1/f = f_1 / f_2$
d) $1/f = 1/f_1 + 1/f_2$

PART B (10 x 2 = 20 Marks)

11. Classify the Surveying based upon the nature of the field survey.
12. Define Representative fraction.
13. In an old map, a line AB was drawn to a magnetic bearing of $5^o30'$ the magnetic declination at the time being 1^o East. To what magnetic bearing should the line be set now if the present magnetic declination is $8^o30'$ East.
14. Define Magnetic meridian.
15. Define Reciprocal levelling.
16. Define Horizontal equivalent.
17. How the Parallax can be eliminated?
18. What are the sources of Error in Theodolite work?
19. What are the commonly used optical methods to measure the distance?
20. What is the purpose of using Anallactic lens?

PART C (5 x 14 = 70 Marks)

21. a) i) Explain the Care and Adjustments of Surveying Instruments. (10)
ii) List out the various types of Chains. (4)

(OR)

b) i) Explain the Errors and Mistakes which arise from Chain Measurement. (10)
ii) List out the Instruments used for Setting out Right angles. (4)

22. a) The following bearings were observed in running a closed traverse:

Line	Fore Bearing	Back Bearing
AB	$75^o5'$	$254^o20'$
BC	$115^o20'$	$296^o35'$

CD	$165^{o}35'$	$345^{o}35'$
DE	$224^{o}50'$	$44^{o}5'$
EA	$304^{o}50'$	$125^{o}5'$

At what stations do you suspect the local attraction? Determine the correct magnetic bearings. If declination was $5^{o}10'$ E, what are the true bearings?

(OR)

b) i) Explain the Errors in Compass survey. (6)

ii) Explain any two methods for solving Three point problem (8)

23. a) Describe the Characteristics and uses of Contours with neat sketches.

(OR)

b) In running fly levels from a bench mark of R.L. 183.215m, the following readings were obtained:

B.S	1.215	2.035	1.980	2.625
F.S	0.965	3.830	0.980	

From the last position of the instrument, five pegs at 20 m intervals are to be set out on a uniform rising gradient of 1 in 40; the first peg is to have a R.L of 181.580m. Work out the staff readings required for setting the tops of the pegs on the given gradient.

24. a) i) Write down the general procedure for measurement of Horizontal angles by Repetition method. (8)

ii) What are the checks for angular measurement in closed traverse? (6)

(OR)

b) i) What are the steps necessary for the traverse computation using Gales traverse table? (6)

ii) Explain the temporary adjustments a Theodolite. (8)

25. a) Derive the expressions for Multiplying and Additive constants.

(OR)

b) i) Determine the gradient from a point A to a point B from the following observations made with a tacheometer fitted with an Anallactic lens. The constant of the instrument was 100 and the staff was held vertically: (7)

Inst. Station	Staff point	Bearing	Vertical angle	Staff readings
P	A	134^o	$+10^o32'$	1.360, 1.915, 2.470
	B	224^o	$+5^o6'$	1.065, 1.885, 2.705

ii) With a tacheometer stationed at P, sights were taken on three points A, B and C as follows: (7)

Inst. Station	To	Vertical angle	Staff readings	Remarks
P	A	$-4^o30'$	2.405,2.705,3.005	R.L of A= 107.08m
				Staff held normal
	B	$0^o00'$	0.765,1.070,1.375	R.L of B= 113.41m
				Staff held vertical
	C	$+2^o30'$	0.720,1.700,2.680	Staff held vertical

The telescope was of the draw tube type and the focal length of the object glass was 25cm. for the sights to A and B, which were of equal length, the distance of the object glass from the vertical axis was 12cm. for sight to C, the distance of object glass from the vertical axis was 11cm.

Calculate a) the spacing of the cross hairs in the diaphragm and b) the reduced level to C.

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