Total No of Questions: [12] *SEAT NO. :* [ ]

[Total No. of Pages : 4]

S.E. 2008 (Surveying)

(Semester - II)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Answer any three questions from each section.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Use of Calculator is allowed.*
6) *Assume Suitable data if necessary*

SECTION I

Q1) a) What is declination and what are different types of variations in declinations? [9]

b) In setting up plane at a station A, it was found that the point ***a*** ,representing the station A on the plan was not exactly above the corresponding station A on the ground .if the displacement of a in ***a*** direction at right angles to a ray to P(AP) was 30 cm, find the consequent displacement of ***p*** from its true position, given the following: [9]

a) Scale of the plan, 1cm= 150m, distance AP = 2000 m

b) Scale of the plan (R.F.) =1/600, distance AP =40 m

c) Scale of the plan ,1cm=2m ,distance AP=20m

OR

Q2) a) What is Resection? Describe any two methods of Resection. [6]

b) The following bearings were taken while conducting a close traverse with a compass in a compass in a place where local attraction was suspected: [12]

Line	F.B.	B.B.
AB	80° 45'	260 ° 00'
BC	130° 30'	311 ° 35'
CD	240 ° 15'	60 ° 15'
DA	290 ° 30'	110 ° 10'

At what station do you suspect local attraction? Find the corrected bearing for local attraction and for declination of 1 ° 30'W

Q3) a) Explain digital self leveling level with the help of neat sketch of sectional view of self leveling level. [8]

b) Write a short note on uses of contour maps for engineering purposes. [8]

OR

Q4) a) Describe briefly the effect of curvature and refraction in leveling. Derive an expression for curvature correction and for combined curvature and refraction correction. [8]

b) What are the various methods of interpolating contours? State the suitability of each one of them . [8]

Q5) a) Derive an expression for the error in the horizontal angle between the two stations as given by the theodolite instrument. [8]

b) A closed traverse has the following lengths and bearings. [8]

Line	Length	Bearing
AB	200 m	Roughly east
BC	98 m	178 °
CD	Not obtained	270 °
DA	85.4 m	1 °

The length CD could not be measured due to some obstruction to chaining. The bearing of AB could not be taken as the station A is badly affected by local attraction. Find the exact bearing of the side AB and calculate the length CD.

OR

Q6) a) The measured lengths and bearings of a closed traverse ABCDE run in the counter clockwise direction are tabulated below. Calculated the lengths of CD and DE. [8]

Line	Length	Bearing
AB	298.7	0 ° 0'
BC	205.7	N25 ° 12' W
CD	?	S75 ° 6' W
DE	?	S56 ° 24'E
EA	213.4	N35 ° 36' E

b) Differentiate between Bowdith's rule and transit rule for the adjustment of a transverse. Explain both the methods of adjustment. [8]

SECTION II

Q7) a) Discuss the following terms related to the Theodolite [8]

1. Spire test 2.Vertical circle index test 3.vertical Arc test

b) Two sets of techeometeric readings were taken from an instrument station A (R.L. =100.00 m) to a staff station B as shown below [8]

Instrument	P	Q
Multiplying constant	100	95
Additive constant	0.3	0.45
Height of instrument	1.40 m	1.45 m
Staff reading	Vertical	Normal

Instrument	Instrument station	Staff station	Vertical angle	Stadia reading		
P	A	B	5 ° 44'	1.090	1.440	1.795
Q	A	B	5 ° 44'	?	?	?

Determine :1) the distance between instrument station and staff station

2) the R.L. of staff station B

OR

Q8) a) Sketch the fundamental lines of theodolite. State the direct relationship between them. [8]

b) What do you understand by tachometry? Discuss the errors in stadia surveying? What is the utility of an anallactic lens in a tachemeter? [8]

Q9) a) Explain in detail the procedure of setting out curve by using two theodolite methods? [6]

b) Two straights intersect at chainage 3000 m with a deflection of 36 ° 48'.it is proposed to intersect a circular curve 750 m radius with cubic spirals 150m long at each end. find the chainage (i) at the beginning and at the end of combined curve and (ii) at the junction of transition curves with the circular arc. [5]

c) Calculate the ordinate at 7.5 m intervals for a circular curve, given that the length of the long chord is 60 m and the radius 180 m. [5]

OR

Q10) a) Two straight lines BA and AC are intersected by a third line EF. The angles AEF and AFE are 27 ° 12' and 32 ° 24' and EF is 180 m. find the radius of the simple curve which will be tangential to the lines BA,EF and AC and the chainages of the beginning and end of the curve, if the chainage of A =1700.0 m. [6]

b) Explain in detail the elements of a Cubic Parabola. [5]

c) Calculate the reduced levels of the various station pegs on a vertical curve connecting two uniform grades of +5% and -7%. The chainage and the reduced level of the point of intersection are 500 m and 330.750 m respectively. Take the rate of change in grade as 1% per 30m. [5]

Q11) a) Define gradient. What is the importance of gradient while laying sewer pipe? How is it decided ? [6]

b) What are advantages of total station survey over thedolite survey? [6]

c) Explain horizontal and vertical control required in construction survey. [6]

OR

Q12) a) Explain step by step procedure of setting out building with total station. [6]

b) Describe setting out tunnel centre line on surface. [6]

c) Write a short note on basic principle of EDM Instruments. [6]