B.Tech

(SEM III) ODD SEMESTER THEORY EXAMINATION 2009-10
SURVEYING-I

Time : *3 Hours]*   *[Total Marks : 100*

Note :   *Attempt all questions.*

1   Attempt any **four** parts of the following :

    (a)   What do you mean by principles of surveying ?   3
        What are different classifications of surveys ?

    (b)   Discuss briefly the different types and sources   3
        of errors in surveying.

    (c)   Define the following :   3
        (i)   EDM
        (ii)   Electronic theodolite.

    (d)   The down hill end of the 30 m tape is held   3
        80 cm too low. What is the horizontal length ?

    (e)   Differentiate the following terms :   3
        (i)   Base line and check line
        (ii)   Main station and tie station
        (iii)   Chainage and offset.

    (f)   What are the different checks in closed traverse   3
        and open traverse ?

2   Attempt any **two** parts of the following :

    (a)   The following consecutive readings were taken   7
        with a level and a 4.0 m staff on a continuously
        sloping ground at a common interval of 30 m.

0.780, 1.535, 1.955, 2.430, 2.985, 3.480, 1.155, 1.960, 2.365, 3.640, 0.935, 1.~~~ ~~~ and ~~~

The reduced level of the first point A was 180.750 m. Rule out a page of a level field book and enter the above reading. Calculate the reduced level of the points by rise and fall method. Also calculate the gradient of the line joining the first and the last point.

(b) Define a contour. Discuss the methods of contouring. What are the various methods of interpolating contours ? State the suitability of each one of them.   7

(c) To determine the elevation of station P in a tachometer survey, the following observations were made with the staff held vertical. The instrument was fitted with an anallectic lens and its multiplying constant was 100.   7

Instrument Station	H.I. (m)	Staff Station	Vertical Angle	Staff Readings (m)
O	1.45	BM	$-6°\,00'$	1.35, 1.895, 2.460
O	1.45	CP	$+8°\,30'$	0.780, 1.265, 1.745
P	1.40	CP	$-6°\,30'$	1.155, 1.615, 2.075

Using these data, determine the elevations of P.

3 Attempt any two parts of the following :

(a) A circular curve has a 200 m radius and $65°$ deflection angle.   6
Calculate the following :

(i) Length of curve   (ii) Tangent length

(iii) Length of long chord (iv) Apex distance

(v) Mid-ordinate.

Assume length of chord as 30 m.

(b) Define vertical curve. What are the types of vertical curves ? Find the length of the vertical curve connecting two uniform grades – 0.5 and + 1.0% respectively. The rate of change of grade is 0.05% per 30 m.　　　6

(c) What are the essential requirements of a transition curve ? Derive an expression for an ideal transition curve.　　　6

4　Attempt any **four** parts of the following :

(a) The following are the bearings of the lines of a closed traverse ABCD :　　　3

Line	Fore Bearing
AB	N 45° 10' E
BC	S 60° 40' E
CD	S 9° 50' W
DA	N 80° 40' W

Calculate the interior angles of the traverse.

(b) Differentiate between the surveyor compass and prismatic compass.　　　3

(c) What are the field checks in :　　　3
　(i) Closed traverse, and
　(ii) Open traverse.

(d) What do you mean by balancing a traverse ? State the various rules meant for it.　　　3

(e) Define the following :　　　3
　(i) Bubble line
　(ii) Compound lens
　(iii) Automatic lens.

(f) State the three point problem. Explain how it is solved by the graphical method.　　　3