Code: CE3T5

II B.Tech - I Semester – Regular Examinations - December 2014

SURVEYING
(CIVIL ENGINEERING)

Duration: 3 hours　　　　　　　　　　　　Marks: 5x14=70

Answer any FIVE questions.　All questions carry equal marks

1. a) Discuss in brief the principles of surveying.　　　　7 M

　 b) A Surveyor measured the distance between two points on the plan drawn to a scale of 1cm = 40 m and the result was 468 m. Later, however, he discovered that he used a scale of 1 cm = 20 m. Find the true distance between the points.
　　　　　　　　　　　　　　　　　　　　　7 M

2. a) A 30 m chain was tested before the commencement of the day's work and found to be correct. After chaining 100 chains, the chain was found to be half decimeter too long. At the end day's work, after chaining a total distance of 180 chains, the chain was found to be one decimeter too long. What was the true distance chained?　　　　7 M

　 b) A chain was tested before starting the survey, and was found to be exactly 20 metres. At the end of the survey, it was tested again and was found to be 20.12m. Area of the plan of the field drawn to a scale of 1 cm = 6 m was 50.4 sq.cm. Find the true area of the field in Sq. metres.　　7 M

3. a) Describe in detail how you would proceed in the field for
　　　　i) profile leveling and ii) cross sectioning.　　　　7 M

b) The following consecutive readings were taken with a level and 5 metre leveling staff on continuously sloping ground at a common interval of 20 metres : 0.385; 1.030; 1.925; 2.825; 3.730; 4.685; 0.625; 2.005; 3.110; 4.485. The reduced level of the first point was 208.125 m. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the points by rise and fall method also the gradient of the line joining the first and the last point.   7 M

4. a) Derive an expression for trapezoidal formula for volume. Compare it with the prismoidal formula.   7 M

   b) At every 30 m along a piece of ground, levels were taken. They were as follows:

m		G.L
0	-	210.00
30	-	220.22
60	-	231.49
90	-	237.90
120	-	240.53
150	-	235.00

   A cutting is to be made for a line of uniform gradient passing through the first and last points. What is the gradient? Calculate the volume of cutting on the assumption that the ground at right angles to the centerline is leveled.
   Given: Breadth of formation 10m: slope of the cutting in each side 1 ½ : 1. Use prismoidal formula.   7 M

5. a) Explain clearly, with the help of illustrations, how a traverse is balanced.   7 M

b) In order to ascertain the elevation of the top (Q) of the signal on a hill, observations were made from two instrument stations P and R at a horizontal distance 1000 metres apart, the stations P and R being in line with Q. The angles of elevation of Q at P and R were 28^0 42' and 18^0 6' respectively. The staff readings upon the bench mark of elevation 287.28 were respectively 2.870 and 3.750 when the instrument was at P and at R, the telescope being horizontal. Determine the elevation of the foot of the signal if the height of the signal above its base is 3 metres.   7 M

6. a) Sighted horizontally, a tacheometer reads 1.645 and 2.840 corresponding to the stadia wires, on a vertical staff 120 m away. The focal length of the object glass is 20 cm and the distance from the object glass to the trunnion axis is 15 cm. Calculate the stadia interval.   7 M

b) To determine the distance between two points C and D, and their elevations, the following observations were taken upon a vertically held staff from two traverse stations A and B. The tacheometer was fitted with an anallactic lens, the constant of the instrument being 100:   7 M

Traverse Station	Ht. of Inst.	Co-ordinates		Staff Station	Bearing	Vertical angle	Staff Readings
		N	E				
A	1.58	218.3	164.7	C	330^020'	$+12^012$'	1.255, 1.860, 2.465
B	1.50	518.2	207.6	D	20^036'	$+10^036$'	1.300, 1.885, 2.470

Calculate: i) The distance CD,
               ii) The R.L. 's fo C and D, if those of A and B
                   were 432.550 m and 436.865 m respectively;
               iii) The gradient from C to D.

7. a) The chainage at the point of intersection of the tangents to a
      railway curve is 3876 links, and the angle between them is
      124^0. Find the chainage at the beginning and end of the
      curve if it is 40 chains radius, and calculating the angle
      which are required in order to set out this curve (i) with a
      theodolite, (ii) with a chain and tape only.   7 M

   b) A railway siding is to be curved through a right angle. In
      order to avoid buildings, the curve is to be compound, the
      radius of the two branches being 8 chains and 12 chains.
      The distance from the intersection point of the end straights
      to the tangent point at which the arc of 8 chains radius
      leaves straight is to be 10.08 chains. Obtain the second
      tangent length, or distance from the intersection point to the
      other end of the curve, and the length of the whole curve.
                                                             7 M

8. a) Explain about geodetic surveying.   7 M

   b) Explain about total station.   7 M