GujaratUniversity		
BE Civil Engineering Sem 4 CE403 Surveying		
Q1	Enlist the temporary and permanent adjustment of transit theodolite. A given line is prolonged with a theodolite, but is found to lie on a curve. Describe how you will find the source of error and how you will adjust the instrument.	10
Q2	Give the object of each of permanent adjustment of theodolite. How would you make the trunnion axis perpendicular to vertical axis	10
Q3	Define latitude, departure and omitted measurements. Explain Gales traverse table for balancing of the traverse.	10
Q4	Below are given the total latitude and departures of two stations A and B referred to the origin of the system: Station / Total Latitude / Total Departure A / + 668.6 / -342.4 B / + 820.2 / + 602.3 A point M fixed by measuring a distanceof 525 meters from A on a bearing of N 20º 12´ W ,and a line MN 1234 m long is set out parallel to AB from M . Calculate the bearing of N from B	10
Q5	Define transit and non transit theodolite; face left and face right; temporary and permanent adjustment; horizontal and vertical angle, least count of vernier and sensitiveness of bubble tube.	10
Q6	Explain with sketches the the step by step procedure for measurement of horizontal angle by method of repetition and method of reiteration.	10
Q7	Draw sketches and explain the method of radiation and method of intersection. State and explain their suitability.	10
Q8	Draw sketches to explain traversing method and resection method of plane tabling	10
Q9	Define two point and the three point problem. Explain with necessary sketches the solution of two point problem.	10
Q10	Explain the following for the plane table surveying: principle of plane tabling, methods of orientation and advantage of plane tabling	10
Q11	Explain the following for plane tabling: Strength of fix, great triangle, great circle and sources of errors.	10
Q12	i).Enlist the equipments required in palne tabling. ii. Enlist and explain the precautions while plane tabling	10
Q13	Give the difference between theodolite and tacheometer.. Explain: fixed hair, movable hair and the tangential methods of tacheometery	10
Q14	Derive the expression for horizontal and vertical distance in the fixed hair method when the staff is held vertically and measured angle is that of elevation	10
Q15	Describe the method of measuring constants of the tacheometer from field measurements. Determine the value of additive and	10

	multiplicative constants from the following observation table				
	Instrument Station	Staff Reading on	Distance metres	Lower and Upper Stadia Readings metres	
	O	A	150	1.255, 2.750	
		B	200	1.000, 3.000	
		C	250	0.750, 3.255	

Q16	Develop an expression for tangential method of tachometry the expression for horizontal distances and levels for angle of elevation and depression.	10
Q17	i).Define reduction of tacheometer readings. Explain the use of tacheometric tables. Draw the reduction diagrams to explain their use in reducing the readings. ii. State the utility of the anallatic lens	10
Q18	Derive the expression for horizontal and vertical distances for tacheometery fixed hair method when the staff is held normal to the line of sight and the measured angle is that of elevation.	10
Q19	Draw sketches to explain compound curve and reverse curve. Enlist different types of transition curves and draw a sketch to show where they are provided. Explain the advantages of transition curves.	10
Q20	i.Enlist the methods for setting out simple circular curve with the help of chain and tape. ii. Two tangents AB and BC intersect at a point B at a chainage 150.5 m. Calculate the necessary data for setting out a circular curve of radius 100 m and deflection angle of 30º by the methods of offsets from long chord. Make calculation of offset for 10 m, 20 m and 25 m and 25.88 m from the center of long chord	10
Q21	State the necessary formulae and data to be tabulated before setting out of circular curve by Rankines method	10
Q22	Draw sketches to explain the elements of compound curve . Two tangents AB and BC intersect at B . An other line DE intersects AB and BC at D and E Such that angle ADE = 140º. The radius of the first curve is 200 metres and the radius of the second curve is 300 metres. The chainage of B is 950 metres. Calculate the data necessary for setting out the compound curve.	10
Q23	Draw sketches to define the following for the simple circular curve: radius of the curve and its curvature, degree of the curve, chord length, angle of intersection and angle of deflection ,point of chainage and point of curve. Express the elements in terms of deflection angle and the radius of the curve	10

Q24	Develop an expression for setting out a simple circular cuve by the method of offsets from tangent by use of i. radial offsets ii perpendicular offsets, from the tangent	10
Q25	Define sounding. Draw sketches to explain the following methods of sounding: by two angles from shore, by two angles from boat, range and angle from shore.	10
Q26	Explain the principle of echo sounding machine.. Explain the various apparatus and equipments needed for location and making sounding.	10
Q27	The coordinates of the three shore stations on a hydrographic survey are as follows: 	10

Q27 table:

Station	Northing	Easting
A	200	10
B	219	855
C	252	677

If from point D south of the shore stations the angles ADB and BDC were observed to be 92° 56′ and 11°59′ Calculate the coordinates of D

Q28	Explain briefly various methods of plotting the soundings	10
Q29	Give i). Principle of EDM ii) classification of EDM instruments. Explain the functioning of Geodometer	10
Q30	Give the working principle of a GPS. Explain how a total station is superior to a transit theodolite and tacheometer.	10
Q31	Define the following : systematic error, most probable value, conditioned quantity,accidental error and weight of the observation.	10
Q32	While rating a current meter, the following observations were made:	10

Q32 table:

Velocity (v)	No of revolutions (n)
1.5	0.5
5	1.0
7.5	1.7
10	2.5

Using the working formula $v = a*n + b$, and with the use of the least square and the normal equations to find the value of a and b

Q33	i) State and explain the laws of weights ii) Expalin normal and conditioned equations	10
Q34	i)Draw the probability curve giving the relation between frequency of error and size of error to explain the law of accidental errors. ii) Give the rules for assigning weights to observed quantities :	10

	angles ,levels etc	
Q35	i) Calculate the most probable value and most probable error of area of circle of radius 12.25 ± 0.03 m ii) Calculate the most probable value and most probable error of the area of rectangle whose sides are: 100 ± 0.03 m and 50 ± 0.02 m	10
Q36	State and explain the rules for distribution of error to the field measurement. Explain the terms, error, true error, mistake and discrepancy	10
Q37	Draw sketches and define the following terms, latitude, longitude , colatitudes, altitude , horizon and azimuth	10
38	Enlist the various systems of coordinates to locate heavenly bodies. Explain in detail the terrestrial latitude and longitude system to locate the position of point on the surface of earth.	10
Q39	Evaluate in kilometers the value of 1° latitude , 1° longitude and one nautical mile. Give the purpose and utility of astronomy	10
Q40	Define azimuth and declination; zenith and nadir. Find the azimuth of the sun at sunset for a place of 49° latitude ,its declination being given to be 19° S	10