E   **B3E033S**

Reg. No._____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code**: CE 207**
Course Name**: SURVEYING (CE)**

Max. Marks: 100   Duration: 3 Hours

PART A
Answer Any Two Full Questions.

1. (a) Write the primary classification of survey and distinguish between them.   (3.5)
    (b) What is a well conditioned triangle? Why is it preferred in surveying? Examine whether a triangle having sides 80m,60m and 40m is a well conditioned triangle or not.   (4)
    (c) Explain how reciprocal levelling eliminates the effect of atmospheric refraction and earth's curvature.   (4)
    (d) A level is set up at O on a line AB 50m from A and 1400m from B. The staff reading on A is 0.585 m and that on B is 3.695 m. Find the true level difference between A and B.   (3.5)

2. (a) Explain the term Ranging of a line. Describe how you would range a chain line between two points which are not intervisible.   (7.5)
    (b) The following readings refer to reciprocal levels taken with one level.

Instrument Near	Staff Reading on (metres)		Remarks
	P	Q	
P	1.825	2.745	Distance PQ=1010m
Q	0.925	1.605	RL of P =126.36

    Find i) the true RL of Q ii) Combined Correction for curvature and refraction.   (7.5)

3. (a) The following bearings were taken in running a compass survey.

Line	Fore Bearing	Back bearing
AB	124°30'	304°30'
BC	68°15'	246°0'
CD	310°30'	135°15'
DA	200°15'	174°45'

    At what stations do you suspect local attraction? Find the correct bearings of the lines and also compute the included angle.   (7.5)

(b) Define i) Contour ii) contour Interval iii) Contour Gradient iv) Horizontal Equivalent. (4)

(c) Explain the factors affecting the choice of contour interval. (3.5)

PART B
Answer any Two Full questions.

4. (a) Volume of earth work is to be calculated for a railway embankment 12m wide with side slope 1.5:1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a 180m length, the centre heights at 30m intervals in meters as 0.70,1.20,1.75,1.45,1.20,0.95,0.65 using a) prismoidal rule and b) trapezoidal rule. (7.5)

(b) Explain the steps in ascertaining the intervisibility between triangulation stations. (7.5)

5. (a) What is meant by eccentricity of signal? How would you correct the observation when made upon an eccentric signal? (7.5)

(b) The following table gives the latitudes and departures in metres of the sides of a closed traverse ABCDEA

Side	Latitude		Departure	
	N	S	E	W
AB	2.28			13.80
BC	7.55		2.70	
CD		2.37	7.50	
DE	1.23		5.40	
EA		8.69		1.80

Calculate the area of the traverse by latitude and meridian distance method and latitude and double meridian distance method. (7.5)

6. (a) Define the following terms:

i) Mass haul diagram ii) free haul and over haul iii) Lead and lift. (7.5)

(b) Two triangulation stations A and B are 70km apart and have elevations 250m and 290m respectively. Find the minimum height of signal required at B so that line of sight may not pass near the ground than 2 metres. The intervening ground may be assumed to have a uniform elevation of 200m. (7.5)

PART C

Answer any Two Full Questions.

7. (a) the following are the observed values of an angle:

Angle	Weight
50°20'20"	2
50°20'22"	2
50°20'19"	3

Find   i) Probable error of single observation of unit weight.

ii) Probable error of weighted arithmetic mean.

iii) Probable error of single observation of weight 3.   (10)

(b) Explain the following terms

i) Celestial sphere, ii) Zenith and Nadir iii) Observer's Meridian

iv) Hour Circle and Hour angle v) Declination and Polar distance   (10)

8. (a) Form the normal equations for x, y and z in the following equations of equal weight.

$$4x+3y+z =4$$
$$x+3y+2z=6$$
$$4x+y+4z=22$$

If the weights of the above equations are 2,3 and 1 respectively, form the normal equations for x,y,z.   (10)

(b) What is meant by modulation? Explain the different methods of modulation with examples of EDM instruments that use these modulation methods.   (10)

9. (a) The following observations of three angles A, B, C were taken at one station

A= 83°24'6.8"	with weight 3
B=55°09'54.2"	with weight 2
C= 110°09'28.9"	with weight 2
A+B= 138°34'3"	with weight 2
B+C = 165°19'22.1"	with weight 1
A+B+C= 248°43'30.9"	with weight 1

Determine the most probable value of each angle by method of differences.

    (10)

(b) Explain the steps to be followed for the set up of a total station over a point during field work.   (10)

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