CBCS SCHEME

USN | | | | | | | | | | |

17CV34

Third Semester B.E. Degree Examination, June/July 2019
Basic Surveying

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain fundamental principles of surveying. **(06 Marks)**

b. Differentiate between (i) Plan and map (ii) Accuracy and Precision. **(06 Marks)**

c. A survey line BAC crosses a river, A and C being on the neat and distant banks respectively. Standing at D, a point 100 meters measured perpendicular to AB from A, the bearing of C and B are 230° respectively, AB being 50 meters. Find the width of the river. **(08 Marks)**

OR

2 a. Define surveying. Briefly explain the classification of surveying **(08 Marks)**

b. Explain the methods of chaining on sloping ground. **(04 Marks)**

c. A steel tape 30 meters long standardizing at 60°F with a pull of 10 kg and was used in measuring a baseline. Find the correction per tape length if the temperature at the time of measurement was 85°F and pull exerted was 16 kg. Weight of 1 centimeter cube of steel is 7.86 grams and total weight of tape is 0.8 kg. $E = 2.1\times10^6$ kg/cm^2 and co-efficient of expansion of tape per 1°F = 6.2×10^{-6}. **(08 Marks)**

Module-2

3 a. Differentiate between (i) Fore bearing and back bearing (ii) Magnetic bearing and Tone bearing (iii) Magnetic declination and magnetic dip. **(06 Marks)**

b. Explain the uses of theodolite. **(06 Marks)**

c. Determine the included angles in a closed traverse ABCDA conducted in a clockwise direction, given the following bearing observed with a prismatic compass.

Line	AB	BC	CD	DA
Fore bearing	40°	70°	210°	280°

Apply check. **(08 Marks)**

OR

4 a. What are the different methods of measuring horizontal angle using theodolite? Explain any one in detail. **(10 Marks)**

b. Following bearing were observed with a prismatic compass.

Line	AB	BC	CD	DE	EA
Fore bearing	74° 0′	91° 0′	166° 0′	177° 0′	289° 0′
Back bearing	254° 0′	271° 0′	343° 0′	0° 0′	109° 0′

Where do you suspect the local attraction? Find the correct bearings. **(10 Marks)**

Module-3

5 a. Derive distance and elevation formulae for stadia tachometry, when staff held normal to the line of sight, for both an angle of elevation and an angle of depression. **(08 Marks)**

b. The following data is available for a closed traverse ABCDA. Determine closing error and adjust the traverse using transit rule. Take co-ordinates of A(200, 100), compute coordinates of all the stations.

Line	AB	BC	CD	DA
Length (m)	250	123	256	108
Bearing	86° 42′	178° 06′	270° 0′	2° 0′

(12 Marks)

OR

6 a. What are the different methods of balancing the traverse? Explain them. **(08 Marks)**

b. A tachometer is set up at an intermediate point on a traverse course PQ and following observations are made on a vertically held staff.

Staff Station	Vertical angle	Staff intercept	Axial hair readings.
P	+ 8° 36′	2.350	2.105
Q	+ 6° 06′	2.055	1.895

The instrument is fitted with annalistic lens and the constant is 100. Compute the length of PQ and reduced level of Q, that of P being 321.50 meters. **(12 Marks)**

Module-4

7 a. Explain temporary adjustments of a dumpy level. **(06 Marks)**

b. Define the following terms: (i) Bench mark (ii) Back sight (iii) Reduced level (iv) Datum. **(04 Marks)**

c. The following staff readings were observed successively with a level, the instrument have been moved forward after the second, fourth and eighth readings.
0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030, 3.765.
The first reading was taken with the staff held upon a bench mark of elevation 132.135m. Enter the readings in a page of level book and reduce the levels. Apply the usual check. **(10 Marks)**

OR

8 a. Compare rise and fall method of reducing levels with the height of collimation method. **(06 Marks)**

b. The following consecutive readings were taken with a level and 5 meter leveling staff on a continuously sloping ground at common interval of 20 meters.
0.585, 1.830, 1.925, 2.825, 3.730, 4.685, 0.825, 2.005, 3.110, 4.485.
The reduced level of first point was 218.125m. Rule out a page of level book and enter the above readings. Calculate the reduced level of points by rise and fall method and also gradient of the line joining first and last point. **(14 Marks)**

Module-5

9 a. What are the different methods of contouring? Discuss the merits and demerits of each. **(08 Marks)**

b. The following give the values in meters of the offsets taken from a chair line to an irregular boundary calculate the area included between the chain line and irregular boundary and first and last offsets by (i) Simpson rule (ii) Trapezoidal rule.

Distance in m	0	50	100	150	200	250	300	350	400
Off sets in m	10.6	15.4	20.2	18.7	16.4	20.8	22.4	19.3	17.6

(12 Marks)

OR

10 a. What are the different characteristics of contour lines? Explain with neat sketches. **(06 Marks)**

b. Discuss the different methods of determining areas. **(04 Marks)**

Calculate the volume of earth work by prismoidal rule in a road embankment with following data:

Chainage along centre line	0	100	200	300	400
Ground level	201.700	202.900	202.400	204.700	205.900

Formation level at chainage 0 is 203.300m, top width is 12.0 meters, side slope is 2 to 1 and longitudinal gradient is 1 in 100. The ground is level across the centre line. **(10 Marks)**

* * * * *