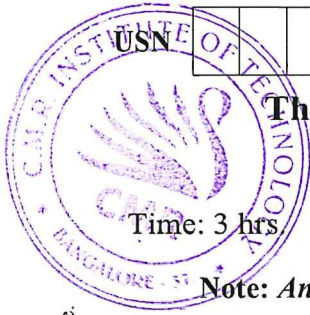


CBCS SCHEME

17CV34



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Third Semester B.E. Degree Examination, Aug./Sept.2020

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. Define Surveying. Explain briefly principles of surveying. (08 Marks)
b. Differentiate between Plan and Map. (04 Marks)
c. A 20m chain was found to be 10cm too long after chaining a distance of 1500m. It was found to be 18cm too long at the end of days work after chaining a total distance of 2900m. Find the true distance if the chain was correct before the commencement of the work. (08 Marks)

OR

- 2 a. Define Ranging. Explain indirect or reciprocal ranging. (06 Marks)
b. Discuss the classification of surveying. (08 Marks)
c. In passing an obstacle in the form of a pond, stations, A & D on the main line, were taken on the opposite sides of the pond. On the left of AD, a line AB, 200m long was laid down and a second line AC 250m long was ranged on the right of AD, the points B, D and C being in the same straight line. BD and DC were chained and found to be 125m and 150m respectively. Find the length of AD. (06 Marks)

Module-2

- 3 a. Distinguish between i) Fore bearing and back bearing ii) Whole circle bearing and quadrantal bearing iii) Closed traverse and open traverse. (06 Marks)
b. Differentiate between Prismatic compass and Surveyor's compass. (06 Marks)
c. The following bearings were observed with a compass. Calculate the interior angles and apply the check. (08 Marks)

Line	AB	BC	CD	DE	EA
FB	60° 30'	122° 0'	46° 0'	205° 30'	300° 0'

OR

- 4 a. Explain the measurement of a horizontal angle by repetition method. List the errors eliminated by this method. (07 Marks)
b. What are the permanent adjustment of a theodolite? Explain the spire test. (06 Marks)
c. The following bearings were observed while traversing with a compass.

Line	AB	BC	CD	DE
FB	45° 45'	96° 55'	29° 45'	324° 48'
BB	226° 10'	277° 5'	209° 10'	144° 48'

Mention which stations were affected by local attraction and determine the corrected bearings. (07 Marks)

Module-3

- 5 a. What is meant by balancing of traverse? Explain the Bowditch's and Transit method of adjusting the traverse. (08 Marks)
b. Define : i) Latitude and Departure ii) Dependent co-ordinates and independent co-ordinates. (04 Marks)

- c. Calculate the error of closure of adjust the following traverse by using transit rule. (08 Marks)

Line	PQ	QR	RS	SP
Latitude	123.35	93.82	-177.44	-39.21
Departure	35.68	205.86	70.11	-312.25

OR

- 6 a. Derive the expression for distance and elevation when the staff held vertical and the line of sight is inclined. (10 Marks)
- b. Determine the gradient from point A to a point B from the following observations made with a tachometer fitted with an annalistic lens. The constant of instrument was 100 and the staff was held vertically. (Take RL of instrument axis 100.000m).

Inst station	Staff point	Bearing	Vertical angle	Staff readings
P	A	134 ⁰	+10 ⁰ 32'	1.360, 1.915, 2.470
	B	224 ⁰	+5 ⁰ 6'	1.065, 1.885, 2.705

(10 Marks)

Module-4

- 7 a. Define the following terms : i) Benchmark ii) Back sight iii) Reduced level iv) For sight v) Height of instrument vi) Turning point. (06 Marks)
- b. Explain the temporary adjustment of a dumpy level. (06 Marks)
- c. To find the elevation of the top 'Q' of a hill, a flag staff of 2m height was erected and observations were made from stations 'P' & 'R' 60m apart. The horizontal angle measured at P between R and the top of the flag staff was 60⁰ 30' and that measured at R between the top of the flag staff and P was 68⁰ 18'. The angle of elevation to the top of the flag staff 'Q' was measured to be 10⁰ 12' at P and that at R was 10⁰ 48'. Staff reading on BM when the instrument was at P is 1.965m and with the instrument at R 2.055m. Calculate the elevation of the top of the hill if that of B.M was 435.065 meters. (08 Marks)

OR

- 8 a. Derive an expression for the horizontal distance, vertical distance and elevation of an object by single plane method, when the base is inaccessible. (10 Marks)
- b. The following staff readings were observed successively with a level, the instrument was shifted after third, sixth and eight readings : 2.228 , 1.606 , 0.988 , 2.090 , 2.864 , 1.262 , 0.602 , 1.982 , 1.044 , 2.684 meters. Rule out a page of level book and determine the RL of points if the first reading was taken with a staff held on a bench mark of 432.384m. (10 Marks)

Module-5

- 9 a. Discuss the methods of determining areas and volumes. (06 Marks)
- b. Define Contour. List the uses of contour maps. (06 Marks)
- c. A series of offsets were taken from a chain line to a curved boundary line at intervals of 15 meters in the following order. 0 , 2.65 , 3.80 , 3.75 , 4.65 , 3.60 , 4.95 , 5.85m. Compute the area between chain line, the curved boundary and the end offsets by i) Trapezoidal rule ii) Simpsons's rule. (08 Marks)

OR

- 10 a. Explain the characteristics of contours with a sketches. (07 Marks)
- b. Define the following terms : i) Contour interval ii) Horizontal equivalent iii) Contour gradient. (03 Marks)
- c. A railway embankment is 10m wide with side slopes 1½ to 1. Assuming the ground to be level in a direction transverse to the centre line, calculate the volume contained in a length of 120 meters, the centre heights at 20m intervals being in meters. 2.2 , 3.7 , 3.8 , 4.0 , 3.8 , 2.8 , 2.5. By i) Trapezoidal rule ii) Simpson's rule / Prismoidal rule. (10 Marks)