

# CBCS Scheme

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15CV34

## Third Semester B.E. Degree Examination, Dec.2016/Jan.2017 Basic Surveying

Time: 3 hrs.

Max. Marks: 80

**Note: Answer FIVE full questions, choosing one full question from each module.**

### Module-1

- 1 a. Define surveying. Enumerate the applications of surveying. (08 Marks)  
b. A chain was tested before starting the survey and was found to be exactly 20m. 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 1cm = 6m was 50.4cm<sup>2</sup>. Find the true area of the field in Sq.m. (08 Marks)

**OR**

- 2 a. Define Ranging. Explain indirect or reciprocal ranging with sketch. (08 Marks)  
b. Two stations P and Q on the main survey line were taken on the opposite sides of a pond. On the right of PQ a line PR, 210m long was laid down and another line PS, 260m long was laid down on the left of PQ. The points RQ and QS are 85m and 75m respectively. Compute the length of PQ. (08 Marks)

### Module-2

- 3 a. Differentiate between Prismatic compass and surveyors compass. (06 Marks)  
b. The following bearings were observed while traversing with a compass

Line	FB	BB
AB	45°45'	226°10'
BC	96°55'	277°05'
CD	29°45'	209°10'
DE	324°48'	144°48'

Mention which stations were affected by local attraction and determine the corrected bearing. (10 Marks)

**OR**

- 4 a. Enumerate the applications of Theodolite (06 Marks)  
b. Explain the repetition method of measuring the horizontal angle using Transit Theodolite and errors eliminated by that method. (10 Marks)

### Module-3

- 5 a. What is meant by balancing of Traverse? Explain the Bowditch method of adjusting the traverse. (08 Marks)  
b. In a closed traverse ABCDE, the length and bearings of EA has been omitted. Compute the length and bearing of the line EA. (08 Marks)

Line	Length (m)	Bearing
AB	204	87°30'
BC	226	20°20'
CD	187	280°0'
DE	192	210°3'
EA	?	?

OR

- 6 a. Derive the distance and elevation formulae for stadia tachometry, when the staff is held vertical and the line of sight being inclined upwards and downwards. (06 Marks)
- b. To determine the gradient between two points A and B a tachometer was set up at another station 'C' and the following observations were made, keeping the staff vertical.

Staff at	Vertical angle	Staff reading (m)
A	+4°20'00"	1.300, 1.610, 1.920
B	+0°10'40"	1.100, 1.410, 1.720

If the horizontal angle ACB is 35°20', determine the average gradient between A and B,  $K = 100$ ,  $C = 0.0$ . (10 Marks)

**Module-4**

- 7 a. Enumerate the errors in Levelling. (06 Marks)
- b. The following staff readings were observed successively with level, the instrument having 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 on a BM of elevation 132.135m. Enter the readings in a level book format and reduce the levels. Apply the usual checks. (10 Marks)

OR

- 8 a. Define sensitiveness of bubble tube. Describe the field procedure to determine the sensitiveness of bubble tube. (06 Marks)
- b. Find the elevation of the top of the chimney from the following data :

Inst Station	Reading on BM (m)	Angle of elevation	Remarks
A	0.865	18°36'	RL of BM = 421.380m
B	1.225	10°12'	Distance AB = 50m

Stations A, B and top of chimney are in the same vertical plane. Station 'A' is nearer to the chimney. (10 Marks)

**Module-5**

- 9 a. A series of offsets were taken from a chain line to a curved boundary line at intervals of 15m in the following order:  
0, 2.65, 3.80, 3.75, 4.65, 3.60, 4.95, 5.85m.  
Compute the area between the chain line, curved boundary and the end offsets by Trapezoidal and Simpson's rule. (08 Marks)
- b. A railway embankment is 10m wide with side slopes of 1:1.5 (V: H). Assuming the ground to be level in a direction transverse to the centerline, calculate the volume contained in a length of 120m, the centre heights at 20m intervals being in 'm' 2.2, 3.7, 3.8, 4.0, 3.8, 2.8, and 2.5. Compute the volume by Trapezoidal and prismoidal rule. (08 Marks)

OR

- 10 a. Enumerate the characteristics of contours with sketches. (08 Marks)
- b. Calculate the area of a closed traverse ABCDA by independent co-ordinates method.

Line	Lat	Dep
AB	+108	+4
BC	+15	+249
CD	-123	+4
DA	0	-257

(08 Marks)

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