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Third Semester B.E. Degree Examination, Dec.2019/Jan.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. Differentiate clearly between plane and geodetic surveying. (06 Marks)
- b. Discuss in brief the basic principles of surveying. (06 Marks)
- c. A rectangular plot of land measures 20 cm × 30 cm on a village map drawn to a scale of 100 m to 1 cm. Calculate its area in hectares. If the plot is redrawn on a toposheet to a scale of 1 km to 1 cm, what will be its area on toposheet. Also determine the RF of the scale of village map as well as toposheet. (08 Marks)

OR

- 2 a. Explain: (i) Method of taping on sloping ground (ii) Direct method of ranging. (08 Marks)
- b. To continue a survey line AB past an obstacle, a line BC 200 meters long was set out perpendicular to AB and from C angles BCD and BCE were set out at 60° and 45° respectively. Determine the lengths which must be chained off along CD and CE in order that ED may be in AB produced. Also, determine the obstructed length BE. (08 Marks)
- c. A 100 meter tape is suspended between the ends under a pull of 200 N. The weight of the tape is 30 N. Find the correct distance between the tape ends. (04 Marks)

Module-2

- 3 a. Differentiate between: (i) WCB and QB (ii) Prismatic compass and surveyor's compass. (10 Marks)
- b. The following bearing were observed while running a closed traverse:

LINE	FB	BB
AB	75°5'	254°20'
BC	115°20'	296°35'
CD	165°35'	345°35'
DE	224°50'	44°5'
EA	304°50'	125°5'

Mention the stations which are affected from local attraction and the corrected bearings. (10 Marks)

OR

- 4 a. With the help of tabular column, explain the procedure of measuring horizontal angle by (i) Repetition method (ii) Reiteration method (14 Marks)
- b. What is spire test? How it is carried? (06 Marks)

Module-3

- 5 a. Explain Bowditch's rule and Transit rule for adjusting a closed traverse. (10 Marks)
- b. The table below gives the length and bearing of the lines of a traverse ABCDE. Find the length and bearing of EA.

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

(10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.



OR

- 6 a. Find the expression for distance and elevation when the staff is held vertical and line of sight is inclined. (10 Marks)
- b. To determine the gradient between two points A and B a tacheometer was set up to another station 'C' and the following observation 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. (10 Marks)

Module-4

- 7 a. Define: (i) BS (ii) FS (iii) BM (iv) Elevation. (04 Marks)
- b. Give the step by step procedure for temporary adjustment of a dumpy level. (06 Marks)
- c. The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eight reading: 2.228, 1.606, 0.988, 2.090, 2.864, 1.262, 0.602, 1.982, 1.044, 2.684 metres. Enter the above readings in a page of a level book and calculate the RL of points if the first reading was taken with a staff held on a bench mark of 432.384 m. Use H.I method. (10 Marks)

OR

- 8 a. With a neat sketch explain reciprocal levelling. (06 Marks)
- b. Explain the following with neat sketches:
(i) Single plane method [instruments are at same level]
(ii) Double plane method. (14 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, 5.85 m. Compute the area between the chain line, curved boundary and end offsets by trapezoidal and Simpson's rule. (10 Marks)
- b. A railway embankment is 10 m wide, with a side slope of 1.5 to 1. Assuming the ground to be level in the direction transverse to the central line, calculate the volume contained in a length of 120 m, the centre heights at 20 m intervals being in metres. 2.2, 3.7, 3.8, 4.0, 3.8, 2.8, 2.5
Calculate area for all the centre height. Use (i) Prismoidal formula (ii) Trapezoidal rule. (10 Marks)

OR

- 10 a. From a contour map of reservoir the following contour areas were obtained by the planimeter. The top level of reservoirs is 200 m and bottom level is 180 m. Find the quantity of water intake.

Contour (m)	Area (m ²)
200	3850
195	3450
190	2600
185	800
180	400

Use Trapezoidal rule and prismoidal rule. (10 Marks)

- b. Discuss the characteristics and uses of contour (five each). (10 Marks)
