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09ENG2.6

## Second Semester B.Arch. Degree Examination, May/June 2010 Surveying and Levelling

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1 a. Discuss briefly the classification of survey based on i) purpose and ii) instruments used. (10 Marks)
- b. The area of the plan of an old survey, plotted to a scale of 10 mts to 1 cm, now measures as 100.2 cm<sup>2</sup> as found by a planimeter. The plan is found to have shrunk, so that a line originally 10 cms long, now measures 9.7 cms only. There was a note as the plan, that, the 20 mts chain used was 8 cms too short. Find the true area of survey. (10 Marks)
- 2 a. Explain one direct and one indirect method of chaining on a sloping ground. (10 Marks)
- b. To measure a base line a steel tape 30 mts long standardized at 15°C, with a pull of 10 kgs was used. Find the correction per tape length, if the temperature at the time of measurement was 20°C and pull exerted was 16 kgs. Weight of 1 cm<sup>3</sup> (cubic centimeter) of steel is 7.86 gms. Wt. of the tape = 0.8 kg  $E = 2.1 \times 10^6$  kg/cm<sup>2</sup>. Coefficient of thermal expansion of tape/°C =  $7.1 \times 10^{-7}$ . (10 Marks)
- 3 a. Differentiate between:  
i) Gunter chain and Engineer's chain ii) Obstacles to chaining and obstacles to ranging. (10 Marks)
- b. A big pond obstructs the chain line 'ab'. A line 'al' was measured on the left of 'ab' for circumventing the obstacle. The length of 'al' was 901 mts. Similarly another line 'am' was measured on the right of 'ab' whose length was 1100 mts. Points 'm', 'b' and 'L' are on the same straight line. Length of 'bl' and 'bm' are 502 mts and 548 mts respectively. Find the distance 'ab'. (10 Marks)
- 4 a. State 'Three point problem'. Explain how the problem is solved in the field by using 'Bessels method', with a neat sketch. (12 Marks)
- b. List three advantages and disadvantages of plain table surveying. (08 Marks)
- 5 a. Define : i) Back sight ii) Intermediate sight iii) Fore sight iv) Bench mark v) Height of the instrument. (07 Marks)
- b. Differentiate between reciprocal leveling and reciprocal ranging. (07 Marks)
- c. List the five major errors encountered in levelling. (06 Marks)
- 6 a. What is profile leveling? Briefly explain. (08 Marks)
- b. The following consecutive readings were taken with a dumpy level:  
0.795, 1.655, 2.890, 3.015, 0.655, 0.625, 0.955, 0.255, 1.635, 0.860 and 2.375.  
Instrument was shifted after 4<sup>th</sup> and 8<sup>th</sup> readings. The 1<sup>st</sup> reading on bench mark was 550.605. Calculate the RL by "RISK and FALL METHOD". Apply necessary checks. (12 Marks)
- 7 a. Explain temporary adjustments of the theodolite. (08 Marks)
- b. Explain in detail, how is horizontal angle measured using theodolite by  
i) Method of repetition ii) Method of reiteration. (12 Marks)
- 8 a. With neat sketches, explain in detail, the characteristics of the contour. (10 Marks)
- b. Mention the important uses of contour maps. (10 Marks)

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