



Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



III SEMESTER B.TECH (CIVIL ENGINEERING)

END SEMESTER EXAMINATIONS, NOV/DEC 2015

SUBJECT: BASICS OF SURVEYING [CIE- 2104]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitable assumed.

| 1A. | A steel tape was exactly 20m long at 20°C when supported throughout its length under a pull of 5 kg. A line measured with this tape under a pull of 16kg and at a mean temperature of 32°C was found to be 680m long. Assuming the tape is supported at every 20m, find the true length of the line. Given that cross sectional area of the tape = 0.03 cm^2 , $\text{E} = 2.1 \times 10^6 \text{ kg/cm}^2$, $\text{a} = 11 \times 10^{-6}$ per degree Celsius, weight of the tape =10 g/cc. | 4 mark |
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| 1B. | A chain line intersects a pond. Two points A and Bare taken on the chain line on opposite sides of the pond. A line AC, 250m long, is set out on the left of AB and another line AD, 300 m long is set out on the right of AB. Points C,B and D are in the same straight line. CB and BD are 100 and 150m respectively. Calculate the length of AB. | 3 mark |
| 1C. | Draw a detailed figure of a 20m chain and label the parts and dimensions carefully. | 3 mark |
| 2A. | Differentiate between prismatic compass and surveyor's compass. | 5 mark |
| 2B. | Explain with a neat figure how to calculate the length of one side and breaking of an adjacent side if they are omitted because of an obstacle. | 5 mark |
| 3A. | List out the relationships between fundamental axes of the theodolite and significance of each of them. | 5 mark |
| 3B. | Define with respect to theodolite survey: <i>Plunging</i> <i>Trigonometric levelling</i> <i>Telescope normal and inverted</i> <i>Swinging</i> <i>Trunnion axis</i> | 5 mark |
| 4A. | What are the characteristics of Contour lines? Explain with neat diagrams. | 6 mark |
| 4B. | Define and explain Orientation of Table in plane table surveying with neat diagrams. | 4 mark |

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| 5A. | Explain sensitiveness of a bubble tube and derive an expression for the same | 3 mark |
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| 5B. | The following readings were observed successively with a levelling instrument. The instrument was shifted after 5th and 11th readings. 0.585, 1.010, 1.735, 3.295, 3.775, 0.350, 1.300, 1.795, 2.575, 3.375, 3.895, 1.735, 0.635, 1.605 m Draw up a page of level book and determine the RL of various points, if RL of the first point is 136.440m, use the HI method. | 4 mark |
| 5C. | What is profile levelling? Explain the field procedure in detail. | 4 mark |