Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec– 2018**

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| **Code :** | **17CE2002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SURVEYING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| 1. | a. | Distinguish between Plane and Geodetic Surveying. | CO1 | 4 |
| b. | The following readings were taken from the page of an old level book. Fill up the missing readings. Apply all the usual checks.   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **Point** | **BS** | **IS** | **FS** | **RISE** | **FALL** | **RL** | | BM | 1.450 |  |  |  |  | 420.690 | | 1 |  | X |  |  | 1.670 | X | | 2 |  | 4.320 |  |  | X | 417.820 | | 3 |  | X |  |  | X | 417.440 | | 4 |  | X |  | 1.320 |  | X | | 5 | 4.230 |  | X | 2.520 |  | X | | 6 |  | 2.380 |  | 1.850 |  | X | | 7 |  | X |  |  | 1.040 | 422.090 | | 8 |  |  | X |  | X | 420.820 | | CO1 | 12 |
| c. | List the characteristics of Contours. | CO1 | 4 |
| (OR) | | | |  |
| 2. | a. | Discuss the concept of Curvature Correction. | CO1 | 4 |
| b. | A steel tape of nominal length 30m was suspended between supports to measure the length of a line. The measured length of the line on a slope of angle 3o50’ is 29.859m. The mean temperature during measurement was 12oC and the pull applied was 100N. If standard length of tape is 30.005 m at 20oC and the standard pull is 45N, calculate the corrected horizontal length. Take the weight of the tape = 0.15 N/m, Cross sectional area = 2.5mm2, = 1.15x10-5/oC and E = 2x10 5 N/mm2. | CO1 | 12 |
| c. | The following observations were taken in reciprocal leveling:   |  |  |  | | --- | --- | --- | | **Instrument at** | **Staff reading at** | | | **A** | **B** | | A | 1.625 | 2.545 | | B | 0.725 | 1.405 |   Determine the RL of B, if that of A is 100.105. Also calculate the angular error in collimation, if the distance between A and B is 1000 m. | CO1 | 4 |
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| 3. | a. | Recall the Bowditch’s method of balancing a traverse. | CO2 | 4 |
| b. | Discuss the Repetition method of determining horizontal angles with the help of a theodolite. | CO2 | 12 |
| c. | List the 4 general cases of Omitted Measurements. | CO2 | 4 |
| (OR) | | | |  |
| 4. | a. | Discuss the Double Plane method of finding the elevation of an object. | CO2 | 8 |
| b. | The table below gives the lengths and bearings of the lines of a traverse ABCDE, the length & bearing of EA having been omitted. Calculate the length and bearing of the line EA.   |  |  |  | | --- | --- | --- | | **Line** | **Length (m)** | **Bearing** | | AB | 204.0 | 87o30’ | | BC | 226.0 | 20o20’ | | CD | 187.0 | 280o0’ | | DE | 192.0 | 210o30’ | | EA | ? | ? | | CO2 | 12 |
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| 5. | a. | Outline the concepts of anallactic lens. | CO3 | 4 |
| b. | To determine the distance between 2 stations B and a Bench mark, a tacheometer was set up at a point A on the line B-BM and the following observations were made:  (a) When the staff was held at B:  Staff readings = 0.980,1.230,1.480  Vertical Angle = + 8o00’  (b) When the staff was held at BM:  Staff readings = 1.100, 1.580, 2.060.  Vertical Angle = - 6o00’  Determine the RL of B if the RL of BM is 976.000 m. Take k = 100 & C = Zero. | CO3 | 12 |
| c. | Explain the concept and advantages of a Subtense Bar with a neat schematic diagram. | CO3 | 4 |
| (OR) | | | |  |
| 6. | a. | Derive the distance-elevation formula in the tacheometric surveying, for staff held vertical – sight inclined upwards and downwards. | CO3 | 8 |
| b. | A tacheometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff:   |  |  |  |  | | --- | --- | --- | --- | | **Staff Station** | **Vertical Angle** | **Staff Intercept** | **Axial Hair Readings** | | P | +8o36’ | 2.350 | 2.105 | | Q | +6o6’ | 2.055 | 1.895 |   The instrument is fitted with an anallactic lens and the constant is 100. Compute the length of PQ and reduced level of Q, that of P being 321.50 meters. | CO3 | 12 |
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| 7. | a. | Discuss the construction of a Simple Curve by Two-Theodolite Method. | CO4 | 8 |
| b. | A simple circular curve is to have a radius of 573 m. The tangents intersect at chainage 1060m and the angle of intersection is 120o. Find  i. Tangent distance  ii. Chainage at beginning and end of curve  iii. Length of long chord  iv. Degree of curve  v. Number of full and sub-chords | CO4 | 12 |
| (OR) | | | |  |

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| 8. | a. | Summarize the functions, advantages and characteristics of a Transition Curve. | CO4 | 8 |
| b. | A simple curve is to have a radius of 300 m. The tangents intersect at chainage of 1192 m and the deflection angle at intersection is 50.5o. Find the tangent distance, chainage at beginning and end, length of long chord, degree of the curve, and the number of full and sub-chords. | CO4 | 12 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | A base line was measured with a steel tape, which was exactly 30 m at 20oC, and a pull of 6kg and the measured length was 459.242m. Temperature during measurement was 30oC and the pull applied was 10kg. The tape was uniformly supported during the measurement. Find the true length of the line, if the cross-sectional area of the tape was 0.02cm2, the coefficient of expansion per 1oC = 0.0000035 and the modulus of elasticity = 2.1x106 kg/cm2. | CO6 | 8 |
| b. | Enumerate the concepts of a Total Station with its advantages. | CO5 | 12 |