

Roll No. ....

**24067**

**B. Tech 3rd Sem. (Civil Engg.)  
Examination – December, 2015**

**SURVEYING-I**

**Paper : CE-207-F**

*Time : Three Hours ]*

*[ Maximum Marks : 100*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** 1. Question No. 1 is *compulsory*. Attempt *one* question from *each* section.

2. All questions carry equal marks.

3. Assume missing data, if any, suitably.

1. (a) Chainage and offsets

(b) Difference between base line and check line

(c) Face left and face right

(d) Tapes and its types

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P. T. O.

3. (a) A 30 m chain was tested before starting the day's work and found to be 20 cm too short. After measuring a length of 1200 m, the chain was tested again and was found to be 10 cm too long. At the end of day's work the chain was tested again and was found to be 30 cm too long. Find the true length of the line if the total length measured was 2648m. 10
- (b) Define surveying. Explain the classification of surveying in detail. 10

### SECTION - B

4. (a) The bearings of the sides of a traverse ABCDE are as follows :

Side                      Fore bearing                      Back bearing

AB                      107°15'

BC                      22°0'

CD                      281°30'

DE                      189°15'

EA                      124°45'

Compute the interior angles of the traverse. 10

P. T. O.                      24067-7950-(P-7)(Q-9)(15)                      ( 3 )

- (e) Differentiate fly leveling and profile leveling

(f) Swiving of telescope

(g) Reverse circular curve

(h) Enumerate the instruments used in plane table surveying

(i) Transition curves

(j) Local attraction

20

### SECTION - A

2. (a) A 30 m long steel tape was standardized at a temperature of 20°C and with a pull of 100 N. the tape was measured a distance AB when the temperature was 45°C and the pull was 150 N. the tape was supported at the ends only. Compute the corrections per tape length if cross-sectional area of tape is 4 mm<sup>2</sup>, the unit weight of the tape material is 0.0786 N/mm<sup>3</sup>,  $E = 2.109 \times 10^6$  kN/m<sup>2</sup> and co-efficient of expansion of tape per 1°C =  $11.5 \times 10^{-6}$ . 15

- (b) Describe the principles of surveying in detail. 5

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(b) Explain the temporary adjustments of a transit theodolite. 10

7. For a closed traverse ABCDA, the bearings of lines BC and CD could not be measured due to an obstruction. Determine the missing bearings from the following data : 20

Line Length(m) W.C.B.

AB 550 60°00'

BC 1200 ?

CD 880 ?

DE 1050 310°00'

**SECTION - D**

8. (a) To determine the elevation of station P in a tachometric survey, the following observations were made with the staff held vertical. The instrument was fitted with an anallactic lens and 24067-7950-(P-7)(Q-9)(15) ( 5 ) P. T. O.

(b) Define the following : 10

(i) True meridian and magnetic meridian

(ii) Declination and dip

(iii) Difference between WCB and QB

5. (a) Data from a differential levelling have been found

starting with the initial reading on B.M. (elevation 150.485m) are as follows: 1.205, 1.860, 0.125, 1.915, 0.395, 2.615, 0.880, 1.760, 1.960, 0.920, 2.595, 0.915, 2.255, 0.515, 2.305 and 1.170. The instrument was shifted after 3<sup>rd</sup>, 6<sup>th</sup>, 10<sup>th</sup> and 14<sup>th</sup> readings. Put the data in a complete field note form and carry out reduction of levels by Rise and fall method. All units are in meters. 10

(b) Define contour line. Explain the different methods to interpolate the contours. 10

**SECTION - C**

6. (a) What is plane table surveying ? Explain the various methods of plane table surveying in detail. 10

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(b) Two straights intersect at a deflection angle of  $80^\circ$  and are connected by a circular curve of radius 10 chains. Find the length of each end tangent, the 'curve', and the 'long chord', the Apex distance, the 'Mid ordinate of the curve' and the 'Degree of the curve'.

10

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its multiplying and additive constant were 100 and 0, respectively.

Instrument	Staff	Station	Staff readings (m)
O	B.M.		1.45
O	C.P.		1.45
P	C.P.		1.40

If R.L. of B.M. is 250 m, calculate R.L. of P.

15

(b) What is tachometry? What are the different methods of tachometry?

5

9. (a) What do you mean by vertical curve? Explain the different types of vertical curves with neat sketches.

10

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