Printed pages:2 Sub Code: RCE 302

Paper Id | 0 | 0 | 0 | 8 | Roll No. | | | | | | | | | | |

**B. TECH.**
**(SEM III) THEORY EXAMINATION 2017-18**
**SURVEYING**

***Time: 3 Hours*** ***Total Marks: 70***

**Note:** Attempt all Sections. If require any missing data; then choose suitably.

## SECTION A

**1. Attempt *all* questions in brief. 2 x 7 = 14**

a. What are the initial and final sub-cords?
b. What is a 12 cm compass?
c. In a map, it is found that two consecutive contour s cross each other. What would you comment.
d. How is a chain folded and unfolded?
e. What do you mean by normal tension?
f. What is index sketch?
g. What is an azimuth?

## SECTION B

**2. Attempt any *three* of the following: 7 x 3 = 21**

a. Classify surveying on the basis of instruments used and name all equipments necessary for the field work involving any one of them.
b. Explain how details can be surveyed by offset from survey lines. Discuss the relative merits of different types of offsets. Why are short offsets preferred to long ones.
c. The staff readings for a survey work were as follows:
1.810, 2.110, 1.225, 1.455, 0.905, 2.435, 2.810, 2.675 and 1.765.
The level was shifted after the 4th and 7th readings. The first reading was taken on a bench mark of R.L. 50.000. rule out a page of level book and enter the readings:
(i). work out the R.L.s of all stations
(ii). If the staff were held inverted and readings on a ceiling from last instrument position was 3.500, Find the R.L. of the ceiling
(iii). Work out the staff readings on the top of 4 pegs at 20 m intervals from the last station to give an upgrade of 1 in 100.
d. What is Shift? Prove that a transition curve bisects the shift and that the shift bisects the transition curve.
e. Why is a curve provided? Derive an expression for an ideal transition curve.

## SECTION C

**3. Attempt any *one* part of the following: 7 x 1 = 7**

(a) A steel tape was exactly 30 m long at $20^0$C when supported throughout its length under a pull of 10 kg. A line measured with this tape under a pull of 15 kg and at a mean temperature of $32^0$C and found to be 780 m long. Cross-sectional area of the tape = 0.03 $cm^2$, and its total weight = 0.693 kg. $\alpha$ for

steel = 11 x $10^{-6}$ per C and E for the steel = 2.1 x $10^{6}$ kg/cm$^2$.

(b) What are the sources of error in chaining? What precautions would you take to guard against them?

**4. Attempt any *one* part of the following: 7 x 1 = 7**

(a) The following are the observed fore and back bearings of lines of a closed traverse. Correct them where necessary for local attraction

| Line | F.B. | B.B. |
|---|---|---|
| AB | 292$^0$ 15' | 11$^0$ 45' |
| BC | 221$^0$ 45' | 41$^0$ 45' |
| CD | 90$^0$ 05' | 270$^0$ 00' |
| DE | 80$^0$ 35' | 261$^0$ 40' |
| EA | 37$^0$ 00' | 216$^0$ 30' |

(b) What do you understand by balancing the traverse? Describe any three methods of adjusting traverse.

**5. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What is orientation? What are the methods of orientation? Describe the methods with sketch.

(b) What do you mean by contour? Describe the characteristics of contour. State the uses of contour map and contours

**6. Attempt any *one* part of the following: 7 x 1 = 7**

(a) What does the term 'sensitiveness' mean in the context of a bubble? How the sensitiveness of a bubble is determined?

(b) What do you mean by traversing? Describe various methods of traversing.

**7. Attempt any *one* part of the following: 7 x 1 = 7**

(a) Two straights intersect at angle of 122$^0$. The maximum allowable speed of the vehicle on the curve is 80 km/hr. centrifugal ratio is ¼ and the rate of change of radial acceleration is 30 cm/sec$^2$. Calculate the radius of the circular curve and the length of the transition curve.

(b) What is the necessity of transition curve? Describe the different method of finding out its length.