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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 20⁰C 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 32⁰C and found to be 780 m long. Cross-sectional area of the tape = 0.03 cm², and its total weight = 0.693 kg. for

steel = 11×10^{-6} per⁰C and E for the steel = 2.1×10^6 kg/cm².

- (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 122⁰. The maximum allowable speed of the vehicle on the curve is 80 km/hr. centrifugal ratio is $\frac{1}{4}$ and the rate of change of radial acceleration is 30 cm/sec². 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.