B.Tech Odd Semester (CBCS) Exam., December—2018

AGRICULTURAL ENGINEERING

(3rd Semester)

Course No. : AECC–04

(Surveying and Levelling)

Full Marks : 50
Pass Marks : 15

Time : 2 hours

Note : 1. Answer *any* **five** questions.
2. Begin each answer in a new page.
3. Answer parts of a question at a place.
4. Assume reasonable data, wherever required.
5. The figures in the margin indicate full marks for the questions.

1. Draw a sketch of a metric chain and describe the importance of its components during the measurements. 5+5=10

2. Write short notes on the following : 2×5=10

(a) Surveyor's chain

(b) Baseline

(c) Tie line

(d) Ranging rod

(e) Field book

3. *(a)* Write down the differences between the following : 2×3=6

(i) Fore bearing and Back bearing

(ii) Whole-circle bearing and Reduced bearing

(iii) True bearing and Magnetic bearing

(b) A chain line *ABC* crosses a river, *B* and *C* being on the near and distant banks respectively. A perpendicular *BE*, 50 m long is set out at *B* on the left of the chain line. *AB* is 25 m long. The bearings of *C* and *A* taken from *E* are 67°30 and 157°30 , respectively. Find the chainage of *C*, if the chainage of *B* is 275·5 m. 4

4. *(a)* The bearings of the lines *OA*, *OB*, *OC* and *OD* are 30°30 , 140°15 , 220°45 and 310°30 , respectively. Find the angles of *AOB*, *BOC* and *COD*. 5

(b) A closed traverse is conducted with five stations *A*, *B*, *C*, *D* and *E* taken in anticlockwise order, in the form of a regular pentagon. If the FB of *AB* is 30°0 , find the FB of the other sides. 5

5. Write short notes on the following : 2×5=10

(a) Plane table

(b) Alidade

(c) Trough compass

(d) U-fork

(e) Prismatic compass

6. Write down the advantages and disadvantages of plane table surveying. 5+5=10

7. Write short notes on the following : 2×5=10

(a) Datum surface

(b) Elevation

(c) Bench-mark

(d) Height of instrument

(e) Fore sight

8. The following consecutive readings were taken with a level and a 4 metre levelling staff on a continuously sloping ground at common intervals of 30 m :

0·855 (on *A*), 1·545, 2·335, 3·115, 3·825, 0·455, 1·380, 2·055, 2·855, 3·455, 0·585, 1·015, 1·850, 2·755, 3·845 (on *B*)

The RL of *A* was 380·500. Make entries in a level book format and apply the usual checks. Determine the gradient of *AB* using rise and fall method. 10

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