

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: B.ARCH.
BRANCH: ARCHITECTURE**

**SEMESTER : IV
SESSION : SP/19**

SUBJECT: AR4407 SURVEYING

TIME: 3 Hours

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) An offset is measured with an accuracy of 1 in 40. If the scale of plotting is 1 cm = 20 m, find the limiting length of the offset so that the displacement of the point on the paper from both sources of error may not exceed 0.25 mm. [2]
- Q.1(b) What are the instruments used in chain surveying? How a chain survey is executed in the field? [4]
- Q.1(c) To continue a survey line AB past an obstacle, a line BC 200 metres long was set out perpendicular to AB, and from C angles BCD and BCE were set out at 60° and 45° respectively. Determine the lengths which must be chained off along CD and CE in order that ED may be in AB produced. Also, determine the obstructed length BE. [6]
- Q.2(a) Define the terms: [2]
- | | |
|----------------------|---------------------------|
| (i) Magnetic bearing | (ii) Local attraction |
| (iii) Back bearing | (iv) Magnetic declination |
- Q.2(b) Explain, with the help of neat sketch, the prismatic compass and the surveyor's compass. [4]
- Q.2(c) The following bearings were observed in running a closed traverse. [6]
- | Line | F.B. | B.B. |
|------|----------|----------|
| AB | 71° 05' | 250° 20' |
| BC | 110° 20' | 292° 35' |
| CD | 161° 35' | 341° 45' |
| DE | 220° 50' | 40° 05' |
| EA | 300° 50' | 121° 1' |
- Determine the correct magnetic bearings of the lines.
- Q.3(a) Differentiate between the temporary and permanent adjustments of a level. [2]
- Q.3(b) Describe how the procedure of reciprocal levelling eliminates the effect of atmospheric refraction and earth's curvature. [4]
- Q.3(c) The following staff readings were observed successively with a level, the instrument having been moved after third, sixth and eighth readings: [6]
- 2.228; 1.606; 0.988; 2.090; 2.864; 1.262; 0.602; 1.982; 1.044; 2.684 m.
- Enter the above readings in a page of a level book and calculate the R.L. of points if the first reading was taken with a staff held on a bench mark of 432.384 m.
- Q.4(a) Define the following terms used in plane table surveying: [2]
- | | |
|--------------------|----------------|
| (i) Orientation | (ii) Radiation |
| (iii) Intersection | (iv) Traverse |
- Q.4(b) Discuss the characteristics of contours. Give suitable sketches. [4]
- Q.4(c) What is resection? Describe any two methods of resection in detail. [6]
- Q.5(a) Explain the working principles of the Abney Level. [2]
- Q.5(b) Explain the Tangent Clinometer. For what purpose is it mainly used and how? [4]
- Q.5(c) Describe the Pentagraph. Explain how it is used for enlarging and reducing plans and maps. [6]
- Q.6(a) Differentiate between: [2]
- | |
|---|
| (i) Face left and face right condition |
| (ii) Plunging and swinging of the telescope |
- Q.6(b) Describe the procedure of measuring horizontal angles by repetition method. [4]
- Q.6(c) Discuss any two methods of traversing with a theodolite and highlight their relative merits and demerits. [6]

- Q.7(a) Differentiate between Digital Levels and Auto Levels. [2]
Q.7(b) What is GPS? Explain how position of a flying object can be obtained using GPS. [4]
Q.7(c) What is a Total Station? Explain the various components of a Total Station and enlist the functions of a Total Station. [6]

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