

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Backlog), November 2018

B. Tech in Civil Engineering, Semester III

Roll No.....

CE308 : SURVEYING

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
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Q.1A Objective type multiple choice questions (10 questions @ 1 mark) 10

- i. Which of the following methods of theodolite traversing is suitable for locating the details which are far away from transit stations?
 - (A) Measuring angle and distance from one transit station
 - (B) Measuring angles to the point from at least two stations
 - (C) Measuring angle at one station and distance from other
 - (D) Measuring distance from two points on traverse line
- ii. After fixing the plane table to the tripod, the main operations which are needed at each plane table station are
 - (i) Levelling
 - (ii) Orientation
 - (iii) CenteringThe correct sequence of these operations is:
 - (A) (i), (ii), (iii)
 - (B) (i), (iii), (ii)
 - (C) (iii), (i), (ii)
 - (D) (ii), (iii), (i)
- iii. There are two stations A and B. Which of the following statements is correct?
 - (A) The fore bearing of AB is AB
 - (B) The back bearing of AB is BA
 - (C) The fore and back bearings of AB differ by 180°
 - (D) All the above
- iv. For the construction of highway (or railway)
 - (A) Longitudinal sections are required
 - (B) Cross sections are required
 - (C) Both longitudinal and cross sections are required
 - (D) None of these
- v. Imaginary line passing through points having equal magnetic declination is termed as
 - (A) Isogonal line
 - (B) Agonic line
 - (C) Isoclinic line

- (D) None of these
- vi. Closed contours, with higher value inwards, represent a
 (A) Depression
 (B) Hillock
 (C) Plain surface
 (D) None of the above
- vii. During Plane table surveying the Intersection method is used when :
 (A) The distance between the points and instrument station are small (with in tape length)
 (B) The distance between the points and instrument station are too large.
 (C) both of above
 (D) None of these
- viii. Metric chains are generally available in
 (A) 10 m and 20 m length
 (B) 15 m and 20 m length
 (C) 20 m and 30 m length
 (D) 25 m and 100 m length
- ix. Systematic errors are those errors
 (A) Which cannot be recognised
 (B) Whose character is understood
 (C) Whose effects are cumulative and can be eliminated
 (D) None of these
- x. Contours of different elevations may cross each other only in the case of
 (A) An overhanging cliff
 (B) A vertical cliff
 (C) A saddle
 (D) An inclined plane

Q.2 Short answer type questions (4 questions @ 2.5 marks)

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Write short note on the following:

- i. Turning Point
- ii. Leveling staff
- iii. Magnetic declination
- iv. Benchmark

Q.3A Explain the following terms:

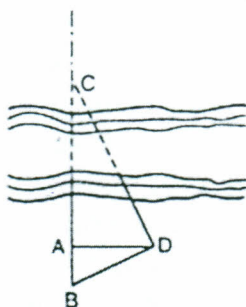
- i. Geodetic Survey
- ii. Cadastral surveying

Q.3B The area of the plan of an old survey plotted to a scale of 10 meters to 1 cm measures now as 100.2 cm² as found by planimeter. The plan is found to have shrunk so that a line originally 10 cm long now measures 9.7 cm only. There was also a note on the plan that 20 m chain used was 8 cm too short. Find the true area of survey.

Q.4A Explain the "Radiation Method" for locating the details of points during plane table survey.

Q.4B A survey line BAC crosses a river, A and C being on near and distant banks

respectively. Standing at D, a point 50 m measured perpendicularly to AB from A, the bearings of C and B are 3200 and 2300 respectively, AB being 25 m. Find the width of river.



Q.5A How will you find the location of the position, on the plan, of the station occupied by the plane table by means of observations to three well defined points whose positions have been previously plotted on the plan?

Q.5B Explain in details how you will proceed in the field for:

- i. Profile levelling
- ii. Cross sectioning

Q.6A Define the scale. Explain the various types of scales used in surveying.

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Q.6B Explain the common systems of notation of bearings.

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OR

Q.6B In passing an obstacle in the form of a pond, stations A and D, on the main line, were taken on the opposite side of the pond. On the left of AD, a line AB, 200 m long was laid down and a second line AC, 250 m long, was ranged on the right of AD, the points B, and D and C being in the same straight line. BD and DC were then chained and found to be 125 m and 150 m respectively. Find the length of AD.

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Q.7A Explain the "traversing", the method which is widely used to laydown survey lines, in case of plane table surveying.

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Q.7B Write brief note on the following

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- (i) Barometric leveling
- (ii) Trigonometric leveling

OR

Q.7B (a) Define Magnetic Declination.

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(b) The magnetic bearing of a line AB is $S 28^{\circ} 30' E$. Calculate the true bearing, if the declination is $70^{\circ} 30' West$.

Q.8A The following consecutive reading were taken with a level and 5 metre levelling staff on continuously sloping ground at a common interval of 20 meters :

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0.385; 1.030; 1.925; 2.825; 3.730; 4.685; 0.625; 2.005; 3.110; 4.485.

The reduced level of first point was 208.125 m. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the points by rise and fall method and also the gradient of the line joining the first and last point.

Q.9A Explain how contouring indicates the elevations directly? Write about contour interval, characteristics of contour, and the value of contour interval for various purposes like building site, town planning and location survey etc. 10

Q.9B It was require to ascertain the elevation of two points P and Q and a line of levels was run from P to Q. The levelling was then continued to a B.M. of 83.500, the reading obtained being as shown below: Obtain the R.L. of P and Q. 10

S.N.	B.S.	I.S.	F.S.	R.L.	Remarks
1	1.622				P
2	1.874		0.354		
3	2.032		1.780		
4		2.362			Q
5	0.984		1.122		
6	1.906		2.824		
7			2.036	83.500	B.M.

OR

Q.9B Discuss the following w.r.t. Global Positioning System: 10

- How GPS works?
- Space Based Triangulation
- Factors affecting GPS accuracy
- GPS Applications