

PURWANCHAL UNIVERSITY**II SEMESTER FINAL EXAMINATION-2008****LEVEL** : B. E. (Civil)**SUBJECT:** BEG158CI: Survey-I**TIME:** 03:00 hrs**Full Marks:** 80**Pass marks:** 32

Candidates are required to give their answers in their own words as far as practicable.

All question carry equal marks mark. The marks allotted for each sub-question is specified along its side. Assume data if necessary.

Answer FIVE questions.

- Q. [1] [a]** What do you mean by surveying? Write down the uses of surveying in the engineering field. [2+6]
- [b]** A base line AC was measured in tow parts along two straight drains AB and BC of length 1650m and 1819.5m with a steel tape with was exactly 30m at 25°C at a pull of 100N. The applied pull during measurement of both parts was 200N whereas respective temperatures were 45°C and 40oC. The slope of drains AB and BC were 3° and 3°30' and deflection angle of BC was 10° right. Find the correct length of the base line if the cross-section area of the tape was 2.5mm². The coefficient of expansion and modulus of elasticity of tape material were 3.5 ×10⁻⁶ par 1°C and 21×10⁵ N/mm² respectively.
- Q. [2] [a]** What are the different obstacles in chaining? How will you overcome the same, explain any one. [8]
- [b]** The following bearings were taken in traversing with a compass in a plain where local attraction was suspected:

Line	Fore bearing	Back bearing
AB	S 45° 30' E	N 45° 30' W
BC	S 60° 00' E	N 60° 40' W
CD	S 5° 30' E	N 3° 20' W
DA	N 83° 30' W	S 85° 00' E

Locate the local attraction and determine th corrected bearings. Also determine the true bearings is the declination at a place is 1° 30' w.

- Q. [3] [a]** What are temporary adjustment of a level? How ar these accomplished? Explain. [6]
- [b]**The following consecutive readings were taken with a level and a 4m leveling staff on a continuously sloping ground at common interval of 30m.
0.855 (on A), 1.545 , 2.335 ,3.825 ,0.455, 1.380, 055, 2.855, 3.455, 0.585, 1.0151.850, 1.850, 2.755, 3.845 (On B).
- Q. [4] [a]** How do you perform compass surveying in the field? Explain with necessary sketches. [8]
- [b]** What are the different methods of plane tabling? Explain any two of them with necessary sketches. [8]
- Q. [5] [a]** Write down the desired relationship of fundamental lines of a transit theodolite. Find the horizontal angle for the following data: [4+4]
Initial reading = 0.0°0''
First angle = 30°25'20''
No. of repetition = 8 times.
- [b]** Write down the classification of triangulation with their specifications. [8]
- Q. [6] Write short notes on any TWO:** [4×4=16]
(a) Optical square
(b) Magnetic declination.
(c) Bench mark.
(d) Reciprocal ranging.

PURWANCHAL UNIVERSITY**II SEMESTER CHANCE EXAMINATION-2008****LEVEL** : B. E. (Civil)**SUBJECT:** BEG158CI: Survey-I**TIME:** 03:00 hrs**Full Marks:** 80**Pass marks:** 32

Candidates are required to give their answers in their own words as far as practicable.

All question carry equal marks mark. The marks allotted for each sub-question is specified along its side. Assume data if necessary.

Answer FIVE questions.

- Q. [1] [a]** What are the measurements used in plane surveying? Write the difference between plane and maps. [4+2]
- [b]** A steel tape was exactly 30m long at 20°C When supported throughout its lengths under a pull of 10kg. A line measure with this tape a pull of 15kg and at a temperature of 32°C and found to be 780m long. The cross-sectional area of the tape = 0.03cm^2 and its total weight = 0.693 kg. α for steel = 11×10^{-6} per °C and E for steel = 2.1×10^6 kg/cm². Compute the true length of the line if the tape was supported during measurement, (i) at every 30m, (ii) at every 15m. [10]
- Q. [2] [a]** What is the principle of chain surveying? Write in short about Reciprocal Ranging. [3+3]
- [b]** Given below-are bearings of the lines of a closed traverse. Adjust the bearing for local attraction. [10]

Line	FB	BB
AB	68°	247°
BC	55°	231°
CD	120°	304°
DE	180°	360°
EF	263°	87°
FG	311°	127°
GH	244°	66°
HA	301	120°

- Q. [3] [a]** Write any five differences between prismatic compass and Surveyor's compass. Find the magnetic declination at a place if the magnetic bearing of the sun at noon is 184° . [5+1]
- [b]** The following consecutive reading was taken with a level and a 4m leveling staff on a continuously sloping ground at common intervals of 30m. 0.85 (on A), 1.545, 2.335, 3.825, 0.455, The RL of A was 380.500. Make entries in a level book and apply the usual checks. Determine the gradient of AB. [10]
- Q. [4] [a]** Write the procedure in detail for measurement of horizontal angle by Repetition method with necessary sketches. [8]
- [b]** Write the advantages and disadvantages of plane tabling. [8]
- Q. [5] [a]** Write three different methods of leveling in detail. Define Magnetic meridian and Arbitrary meridian. [6+2]
- [b]** Two triangulation A and B are 60km apart and have elevation of 240m and 280m respectively. Find the minimum height of signal required at B so that the line of sight may not pass nearer the ground than 2m. The intervening ground may be assumed to have a uniform elevation of 200m. [8]
- Q. [6] [a]** Write about the selection of stations for Triangulation. [8]
- (a) Field book
(b) Two peg test.
(c) Chaining on sloping ground.

PURWANCHAL UNIVERSITY**II SEMESTER CHANCE EXAMINATION-2007****LEVEL** : B. E. (Civil)**SUBJECT:** BEG158CI: Survey-I**TIME:** 03:00 hrs**Full Marks:** 80**Pass marks:** 32

Candidates are required to give their answers in their own words as far as practicable.

All question carry equal marks mark. The marks allotted for each sub-question is specified along its side..

Answer FIVE questions.

- Q. [1] [a]** Explain about “Working from whole to part” with neat sketches. “Location of a point by measurement from two control points” is another principle of surveying. How can you apply this in plane table and compass surveying? [4+4]
- [b]** A 30m steel tape having 0.916Kg weight is 29.97 m long at 20°C while supported for its full length with a 5 kg pull. It has a cross sectional area of 3.87mm² and $E = 2.05 \times 10^6$ kg/cm². It is used to make the following observations on the flat ground.
Recorded distance = 1356.250mm.
Average tape temperature = 15°C.
Applied pull on the tape = 12kg.
Slope = 3%.
- Q. [2] [a]** Define closing error, local attraction, and whole circle bearing. Is there any error due to local attraction in included angle at a station? Justify your answer “Prismatic compass can be used as a hand instrument, but surveyor’s compass cannot be used without tripod”. Justify this statement clearly. [3+2+5]
- [b]** A two peg test is used to check to see if the line of sight of telescope is parallel to the bubble tube axis. The instrument is set up halfway between points A and B and staff readings on A and B are 1.563 and 1.865m,

respectively. With the level located near point A, the reading on A is 1.352m, while on B it is 1.649m. What should the last reading on B equal for the instrument to be in proper adjustment? [6]

- Q. [3] [a]** Define check line, tie line, and ill condition triangle. How can you range the intermediate points when the end stations are not inter visible due to raised ground? [3+5]

[b] The following observations were made on a closed compass traverse:

Line	Fore bearing	Back bearing	Remarks
AB	46°00'	255°45'	Station C is free from Local attraction.
BC	125°45'	305°00'	
CD	270°00'	90°30'	
DA	250°30'	71°00'	

Compute the corrected interior angles and find the correct bearings of all lines. [4+4]

- Q. [4] [a]** Define radiation, intersection, resection and orientation. In which condition intersection method is most suitable in plane tabling? Write an three advantages and three disadvantages of plane tabling surveying. [4+1+3]
- [b]** In a trilateration survey, the following observations were made from the three accessible stations A, B, and C to two stations P and Q with the help of EMD.
AB = 1020 m BQ = 1175m
BC = 975 m CP = 990 m
CA = 1050 m CQ = 950m
AP = 1200 m
Find the distance between P and Q.

Figure:

- Q. [5] [a]** Define reciprocal leveling. Profile leveling and cross-sectioning leveling. What is the difference between level line and horizontal line? What type of line would you get when the level instrument is perfectly level? [4.5+1.5]

[b] Explain briefly about the measurement of angles by reiteration method from a station A, the following observations were made from a theodolite by repetition method. Reading on stations P and Q with face left were $00^{\circ}00'00''$ and $163^{\circ}30'00''$.

No. of repetition = 6 times.

Final reading on station Q. = $261^{\circ}00'20''$

Find the mean value of angle PAQ. [6+4]

Q. [6] **Write short note on (any FOUR):** [4×4=16]

[a] Abney Level

[b] Triangulation and trilateration

[c] Principles of chain surveying

[d] parallax and its elimination in level.

[e] A chain line PQR is obstructed by a pond. Line QR passing through the pond. To prolong the chainage; a line AQB was set out such that AR and BR are clear of obstruction. If $AB = 210\text{m}$, $QA = 90\text{m}$, $AR = 185\text{m}$, and $BR = 225\text{m}$. If the chainage of P and Q are 526.35m and 587.50m respectively, find the chainage of R.