

December 2016

SURVEYING

Time Allowed: 3 Hours

Full Marks: 70

Answer to Question No.1 is compulsory and to be answered first.
This answer is to be made in separate loose script(s) provided for the purpose.
Maximum time allowed is 45 minutes, after which the loose answer scripts will be collected and fresh answer scripts for answering the remaining part of the question will be provided.
On early submission of answer scripts of Question No.1, a student will get the remaining script earlier.
Answer any four questions from Group-A & B, taking two from each group.

1. A. Fill in the blanks (any ten): 1x10

- i) The length of the Gunter chain link is _____.
- ii) The Inver tape is made of an alloy of steel and _____.
- iii) The another name of indirect ranging is _____.
- iv) The opening of ring joint in the chain caused the _____ error.
- v) The slope correction may exactly be calculated by the formula _____.
- vi) In geodetic survey the _____ curvature is taken into account.
- vii) Tie line is made for _____.
- viii) The mirror of an optical square is set with the angle of _____ degree.
- ix) The line passing through the equal declination is called _____.
- x) The bearing measured by a prismatic compass is _____.
- xi) The true bearing = Magnetic bearing + _____ declination.
- xii) The principle of plane table survey is _____.

B. State whether the following statements are True or False (any seven): 1x7

- i) Any plane tangential to the level surface at any point is horizontal surface.
- ii) The full form of G.T.S bench mark is great tachometric survey bench mark.
- iii) When the levelling staff is shifted then it is called change point.
- iv) The bubble is brought to centre for centering the levelling instrument.
- v) The elimination of parallax is the part of permanent adjustment.
- vi) The least count of levelling staff is 0.005mm.
- vii) The another name of horizontal line is level line.
- viii) The stadia hair is fixed at object glass.
- ix) Reciprocal levelling is done in the hilly region.

C. Choose the correct answer from the given alternatives (any five): 1x5

- i) The surface of still water is considered to be level / horizontal.
- ii) The real image of the object is form in the plane of cross hair/centre of eye piece.
- iii) Contour line comes nearer in stiff slope / uniform slope..
- iv) In simpson rule the number of ordinate should odd/ even.
- v) The planimeter is used to find out the area /plan of the land.
- vi) The trapezoidal rule is more/less accurate than Simpson rule.
- vii) The bench mark fixed at the end of the days work is called arbitrary/temporary B.M.

Group-A

2. Distinguish between the followings (any four): 4x3

- a) Reciprocal levelling and simple levelling
- b) Trapezoidal rule and Simpson rule
- c) Engineering chain and gunter chain
- d) Vertical cliff and over hanging cliff.
- e) Isogonic line and agonic line
- f) Steel tape and metallic tape

3. a) i) State the error in chain survey.
ii) Why the ill condition triangle is avoided in chain survey?
iii) What is the problem to work from part to the whole?
iv) What is the use of reconnaissance survey?
b) To measure a base line a steel tape 30 m long standardized at 15°C with a pull of 10 kg. Find the correction per tape length if the temperature and pull were 20°C and 16kg during measurement. Weight of 1 c.c of steel is 7.86 gm, weight of the tape is 0.8 kg. $E = 2.1 \times 10^4$, $\alpha = 7.1 \times 10^{-7} / 1^\circ\text{C}$. (2+1+1+2)+6

4. Find the corrected bearing of the line for following fore and back bearing of a traverse done by prismatic compass survey. 8+7

Line	FB	BB
AB	S 37° 30' E	N 37° 30' W
BC	S 43° 15' W	N 44° 15' E
CD	N 73° 00' W	S 72° 15' E
DE	N 12° 45' E	S 13° 15' W
EA	N 60° 00' E	S 59° 15' W

Also find the true bearing of the lines if the magnetic declination is 2°W.

Group-B

5. Explain the four different methods of the plane table survey with sketch. 12

OR

- a) Explain the three point problem with sketch.
b) Write the various error and precaution in plane table survey. 8+4

6. a) Explain the temporary adjustment of the levelling instrument.
b) The following consecutive readings were taken with a dumpy level on a continuously sloping ground at 30 m interval. The RL of last point is 74.150 m.
0.680, 1.455, 1.855, 2.330, 2.885, 3.380, 1.055, 1.860, 2.265, 3.540, 0.835, 0.945, 1.530 and 2.250
i) Rule out a page of level book and enter the above reading
ii) Calculate the RL of different point by height of collimation method
iii) Determine the gradient of the line joining the first and last point. 4+(4+2+2)

7. a) A series of offsets were taken from a chain line to a curve boundary line At an interval of 10 m in the following order- 0.00, 2.85, 3.95, 6.45, 8.60, 8.90, 5.25, 0.00 m. Calculate the area between the chain line and curve boundary line by Simpson rule.
b) Draw the sketch of the following characteristics of the contour with RL value - i) Hill, ii) Overhanging cliff, iii) Valley line, iv) Vertical Cliff. 6+(1.5×4)

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